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NATIONAL ACCOUNTS
INCOME AND EXPENDITURE

By Quarters

1947 - 1952



EDMOND CLOUTIER, C.M.G., O.A., D.S.P.
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NATIONAL ACCOUNTS INCOME AND EXPENDITURE

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FOREWORD

With this report the Dominion Bureau of Statistics commences regular publication of quarterly estimates of the main National Accounts tables. The extension of the annual figures of Gross National Product and Expenditure and Personal Income and Expenditure to a quarterly basis fills an important gap in the statistics available for studying current economic trends. While the annual estimates provide essential background material, the time interval of a full year has been a source of serious handicap for current analysis. Changes occur swiftly in today's economy and to detect and study these changes it is necessary to have access to reliable up-to-date data. The present programme for publication of quarterly estimates provides for their release approximately three months following the close of each quarter.

The quarterly estimates included in this report represent the results of a long period of experiment and development, and they are published at the present time in response to a very great demand for this information. However, the process of improving the data is still in progress. While the statistics, as now published, are believed to reflect the general contours of quarter-to-quarter movements in economic activity, further improvements may be expected in the future, both in reliability of the estimates and in the detail presented.

In addition to the value series of Gross National Product and Expenditure and the related aggregates, expressed in current dollars, the present publication includes seasonally adjusted and deflated estimates.

As is indicated in the main text of this report, production of quarterly estimates of income and expenditure is inherently a more complex task than estimation of their annual counterparts; special problems of concept, method, and interpretation arise. In particular, development of seasonally adjusted data presents major problems. The purpose of adjusting the estimates for seasonal factors is to eliminate from the series those periodic movements which are due to forces which recur seasonally each year and in this manner to isolate more fundamental movements in the data.

While this procedure is essential for purposes of economic analysis, it can only be carried out in approximate terms since it is based on an averaging technique; in addition, in many cases the judgment of the statistician forms an integral part of the process of estimation. The results must therefore be used with care. As more experience is gained and more knowledge built up concerning the characteristics of the various component series, the estimates will be reviewed and adjustments made where necessary.

The value figures expressed in current dollars reflect price changes as well as movements in real output. In order to arrive at estimates of changes in physical production and consumption it is necessary to eliminate the influence of price movements from the changes in the current value data. The calculation is made for Gross National Expenditure only, and the estimates so amended are referred to as the deflated or constant dollar series. In the present report only the current dollar data have been deseasonalized; deseasonalization of the deflated quarterly estimates must await further experience with the data.

The present report is divided into two parts, preceded by an introduction which reviews the main highlights of the statistical results. Part I presents the tabular information. Part II reviews the sources and methods upon which the quarterly estimates rest, and is designed to give users of the data a general background for appraising the reliability of the material. This section also includes notes on the conceptual framework which underlies the quarterly estimates.

The present volume was prepared by the Research and Development Division of the Bureau. In a broad sense, a number of Bureau Divisions have contributed to this report. The estimates of wages, salaries and supplementary labour income and most of the price series used in the deflation project are prepared in the Labour and Prices Division of the Bureau; net income of farm operators from farming operations in the Agriculture Division; and exports and imports of goods and services in the International Trade Division. The basic data for many of the estimates are collected and tabulated in the Industry and Merchandising Division, the Public Finance and Transportation Division, the General Assignments Division, and the Special Surveys Division. The housing data are provided by Central Mortgage and Housing Corporation. In a number of cases it was necessary to institute the direct collection of new basic series in order to make possible the continuing publication of the quarterly estimates. The most important of these are the estimates of quarterly corporation profits, developed by the Research and Development Division and now being continued by the General Assignments Division; and the figures of provincial revenues and expenditures which are obtained from the various provinces through the Public Finance and Transportation Division. The assistance of cooperating firms and governments is gratefully acknowledged.

HERBERT MARSHALL
DOMINION STATISTICIAN

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INTRODUCTORY REVIEW

NATURE OF THE QUARTERLY ESTIMATES

The quarterly estimates of Gross National Product and Expenditure reflect quarter-to-quarter movements in the value of the Nation's total production of new goods and services and show the distribution of income arising in the course of this production; they also indicate the manner in which production is utilized by the major spending groups. They are therefore useful in appraising the demand factors which sustain productive activity, and in assessing the underlying strengths and weaknesses in the current economic situation. In effect, the accompanying tables constitute a quarterly accounting summary for the economy as a whole not unlike the books maintained by business firms for the purpose of appraising past operations and making decisions regarding future action.

Such quarterly estimates represent a logical extension of the basic annual National Accounts but the task of preparing them on a reliable and analytically useful basis is rather more difficult. The special problems involved in the estimation of income and expenditure on a quarterly basis will be apparent from the review of concepts, sources and methods given in Part II. This review provides the background for appraising the nature of the statistics embodied in the quarterly figures and the quality of the overall statistical results. For convenience of reference, however, some of the major special problems encountered in the development of quarterly National Accounts data are briefly summarized here.

First, there is the problem of availability of basic data. While the Bureau's efforts during the last few years to develop basic monthly and quarterly statistics have met with considerable success, monthly and quarterly information is still less plentiful than annual data. Accordingly, special interpolation and projection procedures have had to be used in the quarterly estimates which are not required in the annual figures.

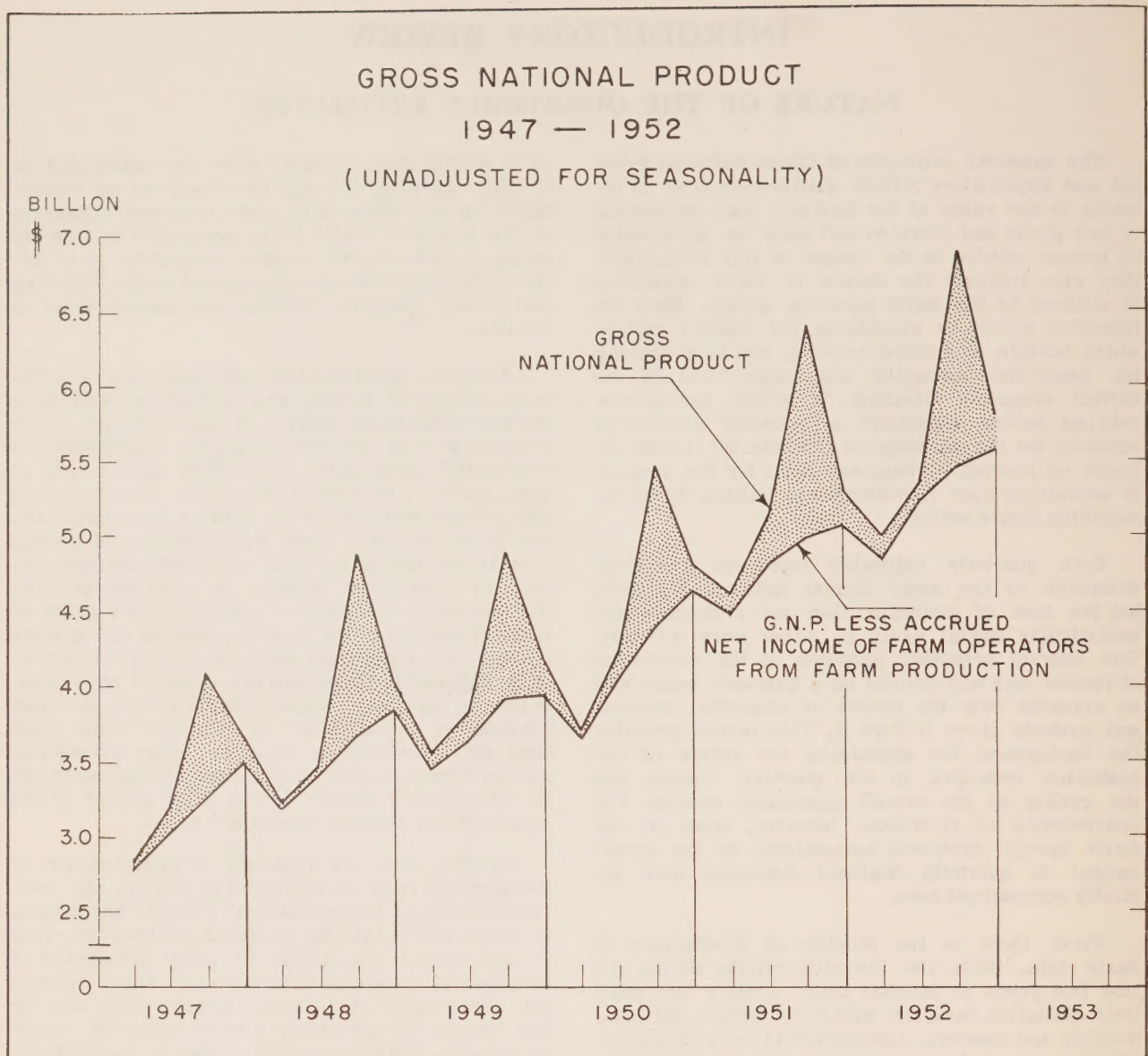
Secondly, although the concepts and definitions which underlie the annual estimates are theoretically consistent with the requirements of the quarterly data, a number of special problems of application arise when an attempt is made to convert this conceptual system to a quarterly basis. For example, the quarterly Gross National Product aims to measure the nation's output through an accounting of all final costs arising in the course of production. Theoretically, it is desirable to include these costs on an accrual basis in order to relate them to the economic activity which gave rise to them. However, a consistent application of the accrual principle is not possible with the information available. The quarterly accounts are therefore necessarily based

on a combination of data which are calculated on a cash basis on the one hand and on an accrual basis on the other, with some resulting unbalance in the accounts. While it is impossible to measure precisely the degree of this unbalance, it is believed that the conclusions reached in the following review are warranted despite the imperfections in the data.

A special problem arises in connection with the measurement of income and production originating in the agricultural sector of the economy. Farm production has marked seasonal characteristics associated particularly with plant growth and in such cases it is difficult to assess the production and income represented by growing inventories not yet in market form. Thus, the harvesting of a grain crop in the fall of the year represents the culmination of productive activity of previous periods. Theoretically, the value of this production might be accrued throughout the plowing, seeding and growing periods. As a practical statistical matter, however, it is impossible to assess the value of grain production in this way. Grain inventories are therefore counted as "production" or "income" only when they reach marketable form, i.e. after harvesting, and as a consequence, the income of farm operators is concentrated heavily in the third quarter of the year in the unadjusted statistical tables.

Thirdly, there are problems of interpretation of the quarterly data. As indicated on page 8, the quarterly figures of Gross National Product are subject to strong and persistent seasonal fluctuations. This is true even if the especially sharp movements of accrued net income of farm operators are eliminated from the totals. As a consequence, their use for the purpose of appraising current economic trends is severely limited, unless account is taken of the special seasonal factors which recur with more or less intensity in the same quarter of each year.

In order to eliminate insofar as is possible the effect of the seasonal fluctuations, those series which appear to exhibit them with more or less regularity have been adjusted with seasonal indexes. The adjustment of a particular series may be of three kinds: (1) the same set of seasonal indexes may be applied to each year; (2) a progressively changing set of seasonal indexes may be applied to successive years; or (3) an abrupt change may be made in the seasonal indexes. The techniques employed are discussed in Part II, Section 2, of this report. As intimated above, the deseasonalization procedure is necessary in order to show whether a rise or fall in the level of the aggregates constitutes a turning point or trend in the basic economic situation or whether it simply reflects a normal seasonal decline or upturn.

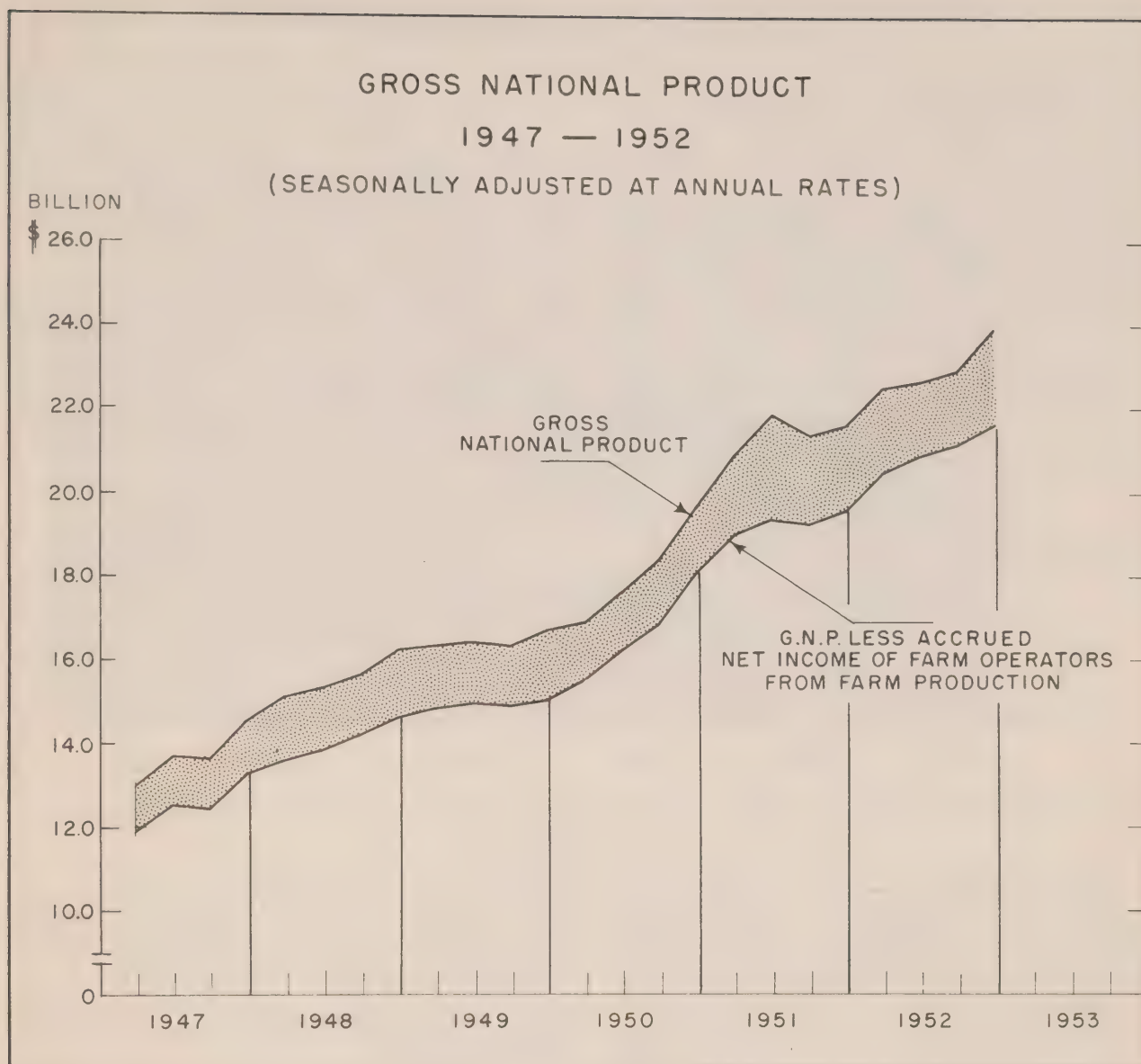


The deseasonalization technique, however, can remove the effects of seasonal factors in approximate terms only. Since the technique is based on the seasonal patterns of a number of years, seasonal indexes, whether constant or changing, may be accurate only within a certain margin of error. In addition, as will be apparent from Part II Section 2, the judgment of the statistician is necessarily involved in the deseasonalization procedure.

Despite the difficulties inherent in the procedure for correcting the data for seasonal movements it is believed that the adjusted totals convey a truer impression of basic economic conditions than can be obtained from examination of the unadjusted magnitudes alone. When multiplied by four, the seasonally adjusted figures provide an indication of the size annual totals would assume if the economy continued to operate at the level of the quarter in question through four successive quarters. The totals so obtained are referred to as "seasonally adjusted at annual rates".

In the case of crop production, the ordinary methods of adjusting the series for seasonal movements are inadequate. Crop production is characterized by concentration of output in the third quarter of the year and by large and erratic fluctuations about any average which may be constructed. Accordingly, the ordinary procedures for deseasonalization give rise to results which may create misleading impressions as to the movement of the Gross National Product. Pending the development of more satisfactory procedures, therefore, a simple expedient was employed of dividing the annual value of crop production into four equal parts in the seasonally adjusted tables. In going into a new year before the crop is known, production is estimated on the basis of average yields of preceding years, estimated acreage and initial prices. This preliminary first quarter estimate is revised later in the year as actual data become available.

In the following review extensive use is made of the seasonally adjusted aggregates.



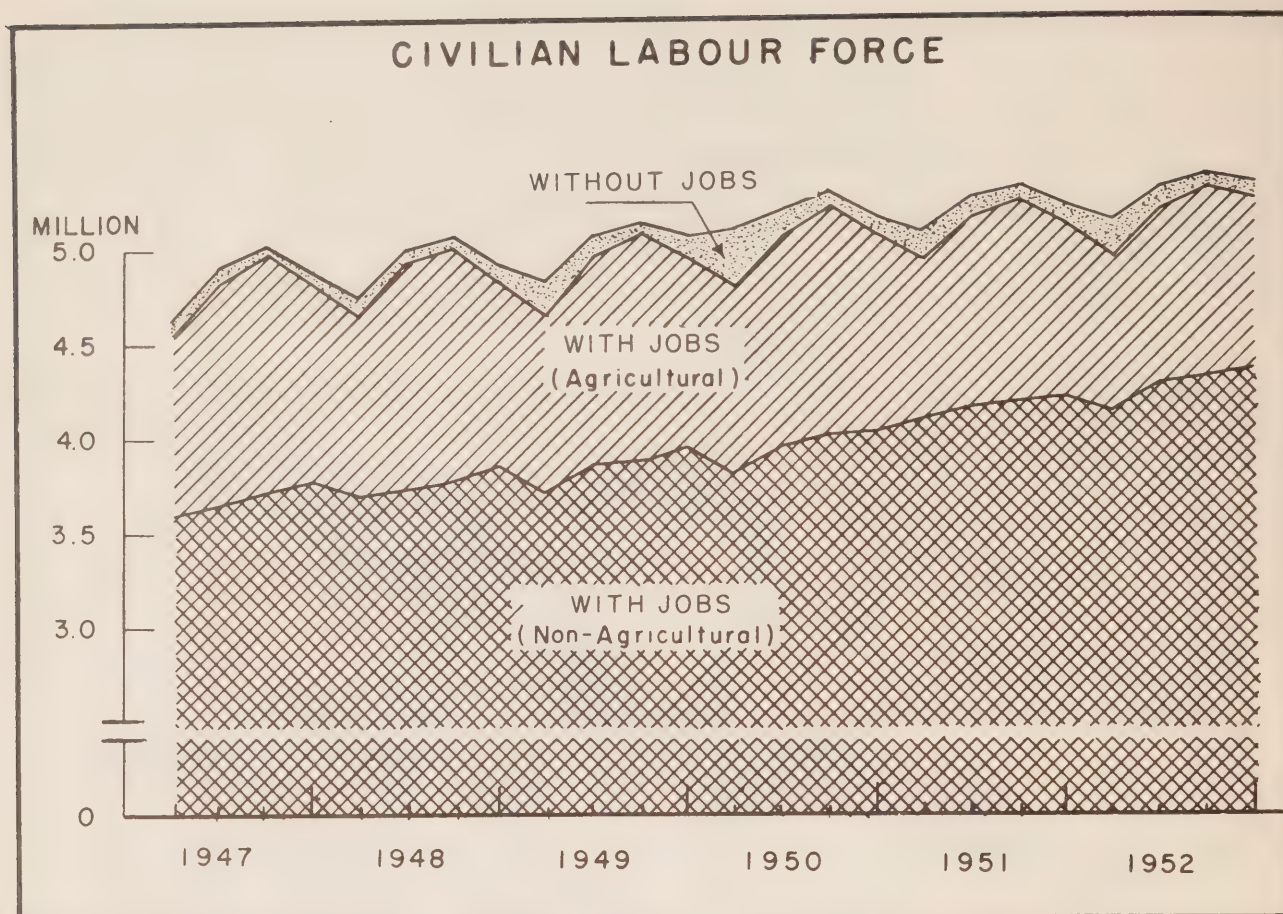
THE POST-WAR PERIOD TO 1952⁽¹⁾

The most impressive characteristic of the Canadian economy during the period covered by this report has been the sustained high rate of industrial expansion and resource development and the accompanying growth in the country's productive capacity. During the years from 1947 to 1952 the physical output of goods and services, as measured by the Gross National Product in constant dollars, increased by 26 per cent, or 5 per cent per year annually compounded, compared with an average increase of 4 per cent per year during the period from 1926 to 1952.

Accompanying the expansion in the country's physical volume of output from 1947 to 1952 the

population of Canada increased by 15 per cent. This rather large increase in population has provided a wider market for the country's production and, at the same time, has made available additional workers for the labour force. Almost without exception, the labour force was fully employed during the period, the percentage of persons without jobs varying between 6.1 per cent at its highest point and 1.3 per cent at its lowest. The number of persons with jobs increased by approximately 8 per cent between 1947 and 1952. The latter increase is substantially below the rise of 26 per cent in the physical volume of production, indicating a considerable gain in output per person.

1. All comparisons include Newfoundland for all years beginning with 1949.



This gain in output per person reflects, in part, the unusually favourable crop of 1952, and, more fundamentally, the high rate of capital investment which has taken place during the period. From 1947 to 1952, gross domestic investment in durable assets by private and government business enterprises amounted to close to \$19 billion, representing, on average, about 17.5 per cent of the country's total output. This rate of investment is greatly in excess of any period since the late 1920's when gross domestic investment (excluding inventories) constituted 18.2 per cent of the national product. Further, the large capital expansion programme was accompanied by a marked shift in the composition of the labour force, from the agricultural sector with a relatively lower output per head, to the non-agricultural sector, with a relatively higher output per worker. Thus,

in 1952 the agricultural sector accounted for only 16.8 per cent of the total labour force, compared with 22.8 per cent in 1947. Finally, it is probable that the rise in output per employed person is associated with the series of discoveries in oil and other natural resources which have increased the country's capacity to produce many of the basic industrial materials.

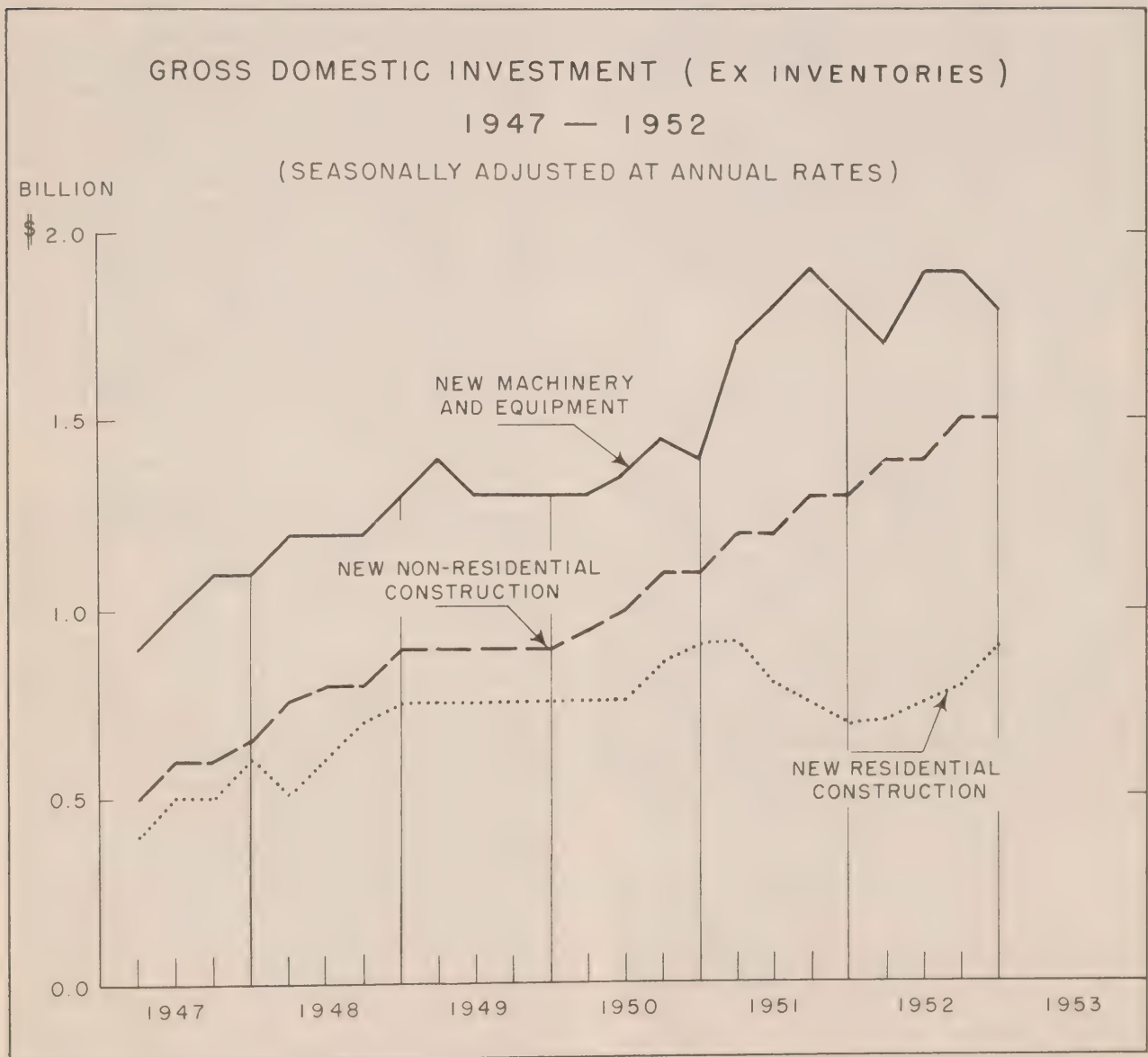
The following pages provide a brief review of economic developments in Canada during the six years from 1947 to 1952, mainly within the confines of the major components of Gross National Product and Expenditure. Before turning to the chronological review, the broad outlines of the course taken by the major expenditure components are summarized.

SUMMARY OF MAJOR EXPENDITURE COMPONENTS

The Canadian economy at the end of the war faced an extraordinary demand for all types of consumer and capital goods. Not only was there a huge accumulation of unsatisfied consumer and business needs, generated by wartime shortages and restrictions, but a large volume of wartime savings was available to make these demands effective¹. Con-

1. Between 1940 and 1945, personal saving (excluding changes in farm inventories), increased by \$7.8 billion, while business saving (including depreciation allowances) increased by \$7.1 billion. Much of this saving was in highly liquid form. For example, resident non-corporate holdings of Government of Canada securities and bank deposits increased by \$7.0 billion during the period; resident corporate holdings of this same type of assets increased by \$3.6 billion.

sequently, at the end of the war there was a very strong upsurge in personal expenditure on consumer goods and services, and in outlays for new construction, and new machinery and equipment. There was also a substantial buildup of business inventory stocks, in contrast with the war years, when additions to stocks were moderate on the whole. These increases in expenditures of the personal and business sectors offset the sharp declines in government expenditure on goods and services which might otherwise have brought about a serious fall in production and employment. At the same time, the demand for Canadian exports remained strong throughout the transition period, with a substantial portion of the total financed by loans and advances to overseas countries.



Gross Domestic Investment

As supplies became more readily available at home and abroad, the level of investment rose sharply. In 1946, expenditures on new construction, machinery and equipment were taking only 11.6 per cent of Gross National Expenditure, but in 1947 the proportion had increased to 15.4 per cent. This proportion rose again in each of the two following years. However, in 1949, the strong upward trend was apparently weakening and throughout the year the seasonally adjusted quarterly data show a perceptible levelling off. This development was reversed in the first half of 1950 when business expenditures on durable assets turned upward, although since prices were rising, the gain in constant dollars was more moderate. The upturn was greatly accentuated by the series of events which began with the outbreak of hostilities in Korea in mid-1950; these brought a new urgency to the expansion of capital facilities and to the development of natural resources. Business investment expenditures on construction, machinery and equipment continued to advance with few important interruptions through 1951 and 1952, in physical terms, as well as in current dollars. Expenditures on housing, however, followed a different course. After substantial gains in the second half of 1950 expenditure on new residential construction, seasonally adjusted, levelled off in the first quarter of 1951 and thereafter declined successively until the second quarter of 1952. In the second quarter, an upward course in house-building activity was resumed which lasted through the remainder of the year.

Accompanying the rise in expenditure on durable capital assets in 1946 and 1947, the business inventory buildup during these years was heavy, in sharp contrast with the war years when, for the most part, additions to business inventory stocks were moderate. By 1948, however, the rate of business inventory accumulation had declined substantially, especially if price changes are taken into account. Additions to business inventories were also moderate in 1949 and through the first part of 1950. In the fourth quarter of 1950, following the outbreak of hostilities in Korea, there was a large upsurge in inventory accumulation which continued throughout the first half of 1951 after which the rate of accumulation began to fall. Nevertheless, for the year 1951 as a whole, the accumulation of business inventories was very large in physical as well as in value terms. Additions to inventories throughout 1952 were very modest and at the manufacturing level there was a substantial net liquidation.

Personal Expenditure on Consumer Goods and Services

The large backlog of deferred demand and the high level of accumulated personal saving also found expression in a high rate of consumer spending in the transition period. In each of the years 1946 and 1947, consumer expenditures rose by approximately \$1.2 billion. Demand for durable goods was particularly heavy. In 1948, there appears to have been a growing resistance to rising prices, while the emergency exchange conservation measures

restricted supplies of certain consumer goods; in real terms consumer expenditure was at a lower rate throughout 1948 than in the previous year. In 1949, however, extraordinary payments in the form of refundable personal taxes and equalization and adjustment payments to farmers from the Canadian Wheat Board contributed, among other factors, to a resurgence of consumer spending; between the first and second quarters of 1949, consumer expenditure, seasonally adjusted, rose both by value and by volume and remained at a high level for the remainder of the year. In addition, there was a considerable inventory build-up in the first half of the year. These developments accompanied the levelling off in investment expenditures which was becoming apparent in 1949, and helped to maintain national income at a high level, despite the recession which had developed in the United States. The outbreak of hostilities in Korea in mid-1950 gave a further impetus to consumer spending, reinforcing an upswing which was already under way. The heavy demands of the latter period were, in large part, a reflection of expectations of shortages and higher prices. However, as the year 1951 progressed and expected shortages did not materialize, consumer spending levelled off; by mid-1951 the volume of consumer purchasing had dropped below the level of the previous year, a reflection, in part, of the heavy forward buying of the immediate post-Korean period and, in part, the effects of government measures to contain inflation and to direct resources to defence requirements. In the early part of the following year, however, the upward course of consumer buying was resumed; in volume terms the first quarter of 1952 was very close to the high level reached in the first quarter of 1951, and for the remainder of the year consumer buying greatly exceeded the corresponding period of a year earlier.

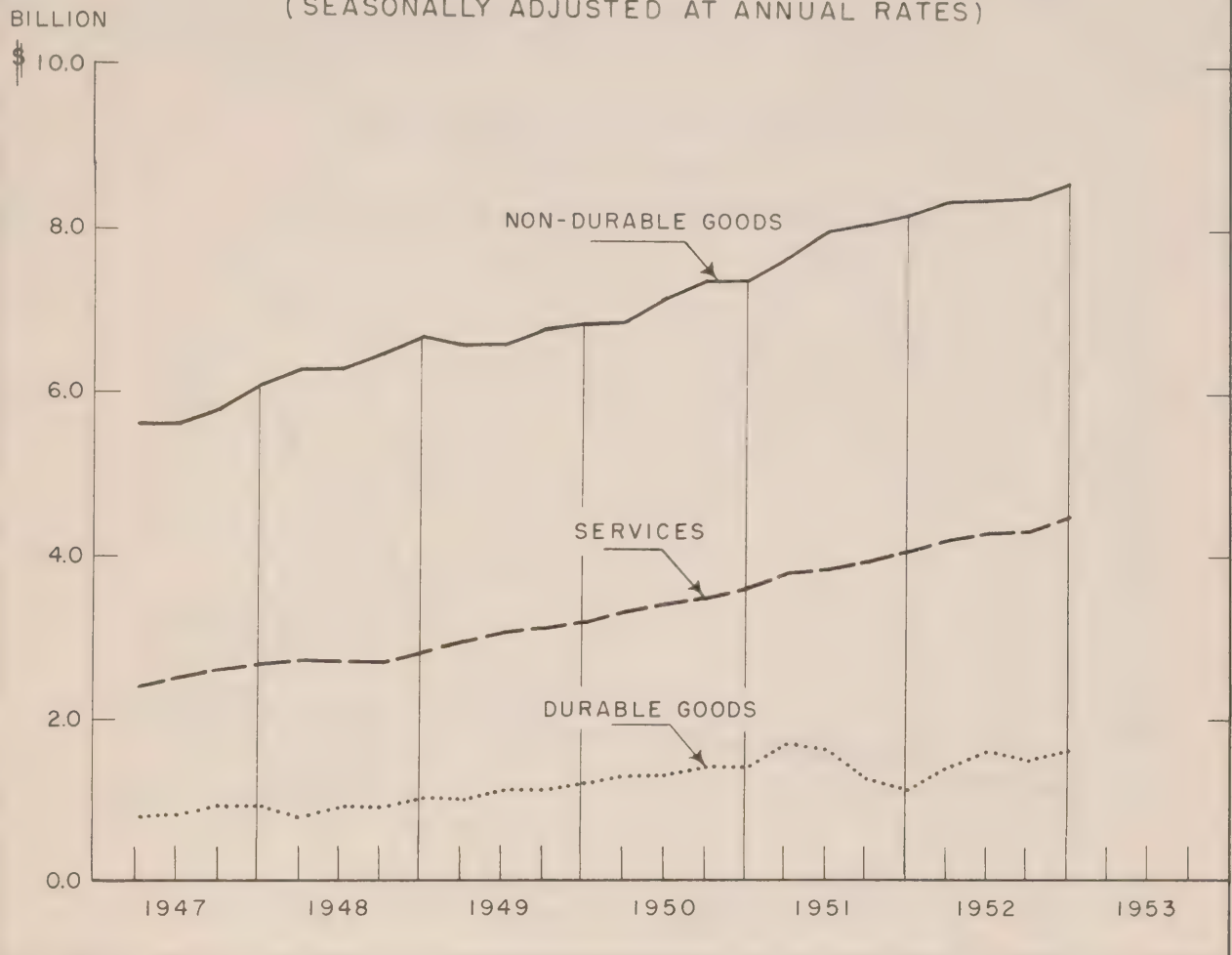
Government Expenditure on Goods and Services

The upsurge of investment and consumer expenditures in the transition period offset the drastic declines in government expenditure on goods and services for war purposes. Between 1945 and 1946 government expenditure on goods and services declined by approximately \$1.9 billion, from \$3.7 billion to \$1.8 billion. It is clear that this huge contraction in demand would have set off a major decline in employment and income had there been no offsetting increases in other sectors of the economy. By the middle of 1947, government expenditures had reached their post-war low. Thereafter, they began to turn upward again, partly in response to the initiation of war-deferred capital construction projects. As a percentage of Gross National Expenditure, however, government expenditure on goods and services showed little variation in the years 1947 to 1950, when they were absorbing about 12 to 13 per cent of total output, compared with 42 per cent in the peak war year 1944. The outbreak of hostilities in Korea in 1950 added new defence demands to normal expenditures, and government outlay began to turn upward at a relatively sharp pace. In 1952 total government expenditure on goods and services absorbed approximately 18 per cent of Gross National Expenditure, with defence outlays accounting for 8 per cent.

PERSONAL EXPENDITURE ON CONSUMER GOODS AND SERVICES

1947 — 1952

(SEASONALLY ADJUSTED AT ANNUAL RATES)



Exports and Imports of Goods and Services

In the foreign sector, Canada's postwar economic expansion has shown considerable variation. At the close of hostilities many overseas countries were faced with the task of reconstructing and rehabilitating the war-devastated areas, and this brought with it a heavy demand for Canadian exports. Thus, although exports of goods and services declined somewhat from 1945 to 1946, they were nevertheless maintained at a high level and in 1947 they turned upward in current dollars, though there was a small decline in volume. Meanwhile, heavy domestic demands for capital and consumer goods and the build-up of inventories greatly stimulated the flow of imports. The latter required cash payment, whereas a substantial portion of exports to overseas countries in these years had been financed

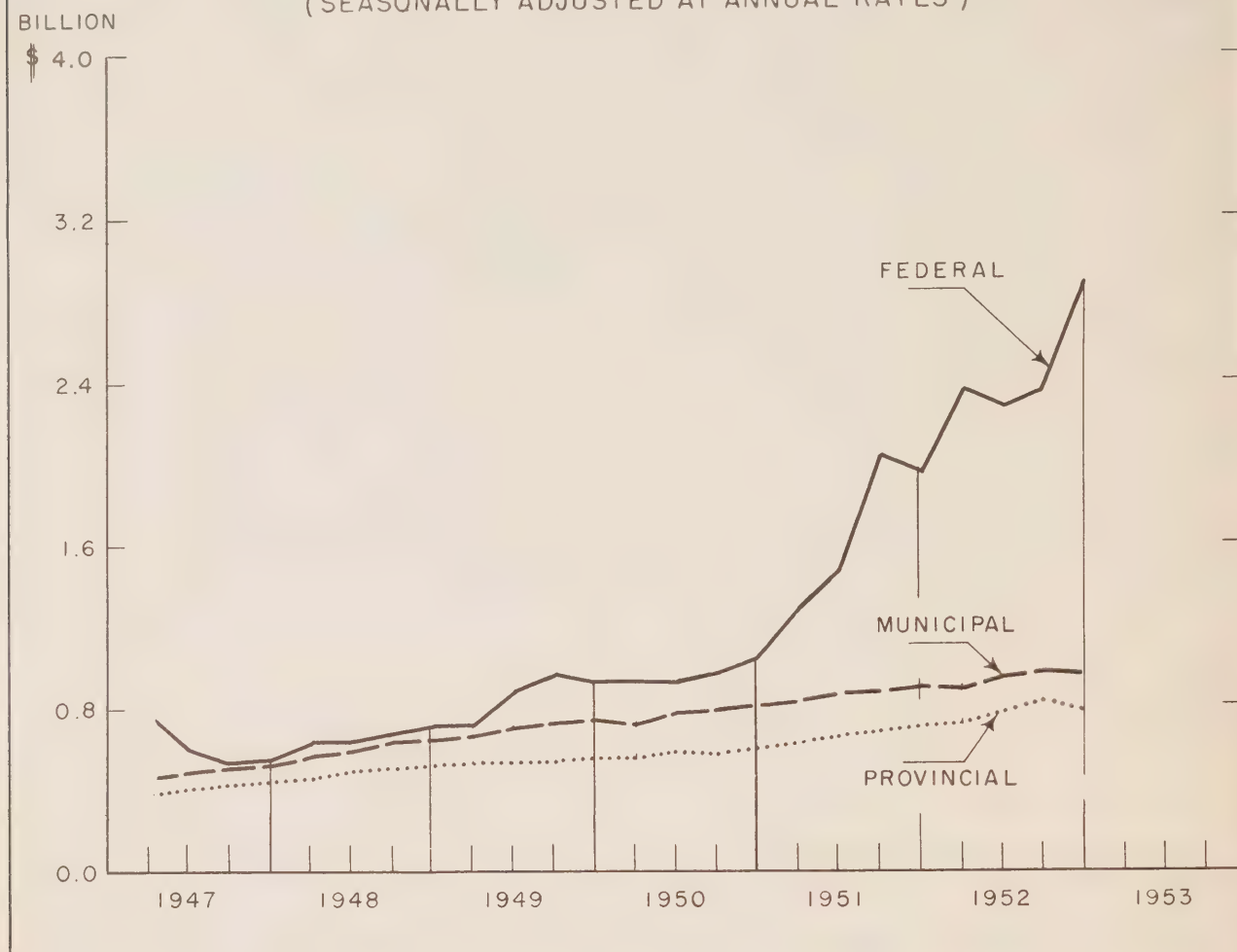
by the extension of grants and loans abroad by the Canadian Government. Accordingly, Canada's exchange reserves by the end of 1947 were down to a critically low level, and a comprehensive programme of import restrictions and exchange conservation was imposed.

In the first quarter of 1948 the volume of imports, seasonally adjusted, declined substantially against a background of exchange conservation measures, lower inventory accumulation and a downturn in the volume of consumer purchasing in the face of rising prices. Although in the successive quarters the value of imports, seasonally adjusted, eased upward, this was due partly to price increases; the volume of imports remained well below the levels of the previous year. The value of exports showed a more pronounced upward trend throughout the year, with the volume being well maintained.

GOVERNMENT EXPENDITURE ON GOODS AND SERVICES

1947 — 1952

(SEASONALLY ADJUSTED AT ANNUAL RATES)



In 1949, by contrast, there were some declines in the value and volume of exports of goods and services, while imports were running at a rate somewhat higher than the preceding year. Imports showed increasing strength in the first half of 1950, reflecting the strengthening of economic activity, greater availability of supplies in overseas markets and the currency devaluations of September 1949. The value of exports, seasonally adjusted, also rose in the second quarter of 1950 after some hesitancy in the preceding quarter.

With the outbreak of hostilities in Korea in mid-1950 and the ensuing acceleration in inventory accumulation, capital expansion, and economic activity generally, the rising trend of imports gained in vigour, reaching a peak in volume and value terms in mid-1951. Import prices were rising rapidly in this period, and the value gains were very large.

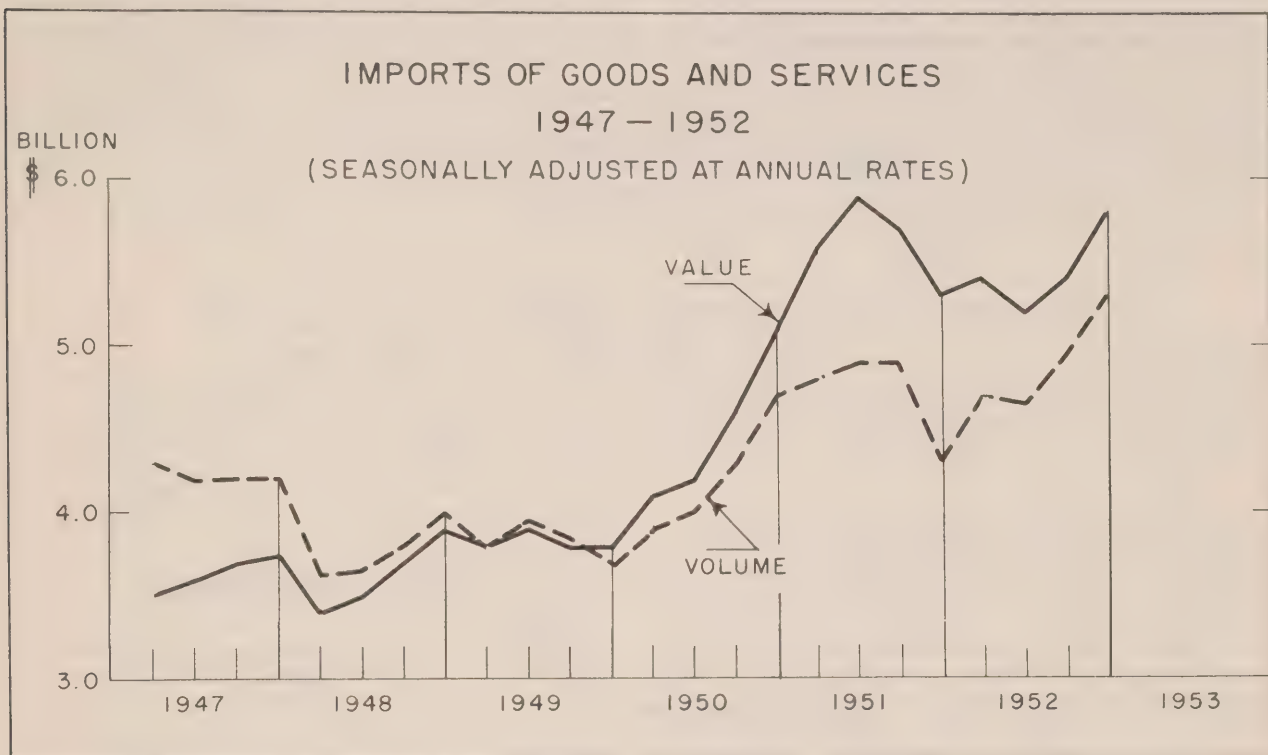
In the last half of 1951, as import prices fell sharply, the value of imports declined and remained at these lower levels throughout most of 1952. However, the value decline in 1952 was entirely due to the drop in import prices; in volume terms, imports rose almost continuously throughout the year.

The value of exports of goods and services also showed a strong and sustained upward movement following the outbreak of the Korean conflict, reaching a peak in the first quarter of 1952. However, the rise in the value of exports was less rapid than that of imports, and export prices rose more slowly. Thus, there was some deterioration in the terms of trade¹ in the latter half of 1950 and the first half

1. That is, the import purchasing power of a unit of Canadian exports.

of 1951, and this contributed to the deficit which was sustained on current account in each of these two years. In the latter half of 1951, the value of exports and export prices continued to rise, while, as noted above, the value of imports and import prices declined. The improvement in the terms of trade in the last half of 1951 continued throughout 1952, as export prices declined more slowly than import prices. Despite the fall in prices, however,

the value of exports was well maintained in 1952. For the year as a whole, a value gain of 10 per cent occurred, the major part of which was accounted for by heavier exports of grain. Reflecting the improvement in the terms of trade and the high level of grain exports, the deficits on current account of the two previous years were replaced by a surplus in 1952.



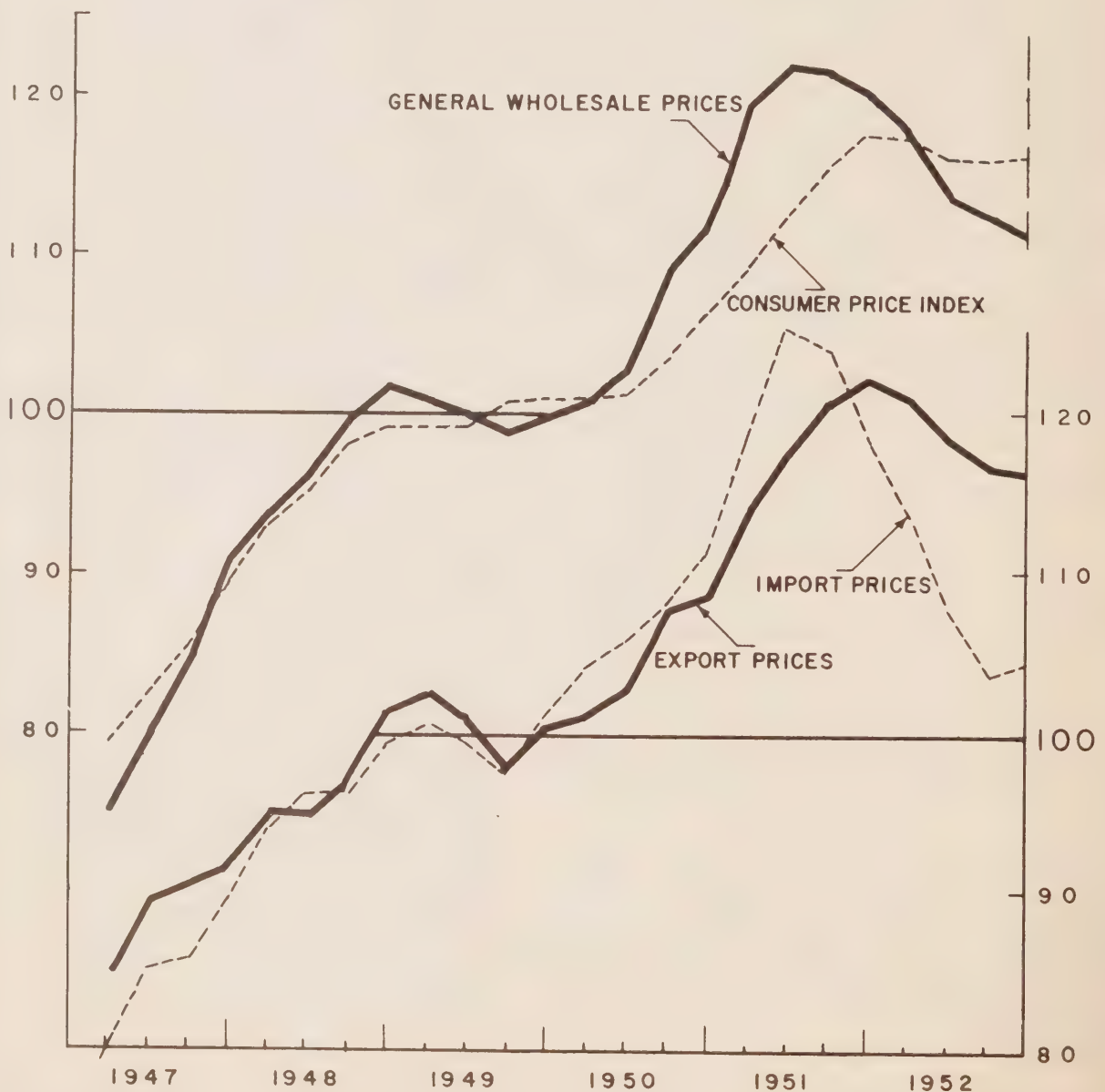
Prices

Canadian price levels were deeply affected by price movements abroad in the post-war period. Price developments in the United States, with whom Canada conducts a very large part of her export and import trade, were of particular importance. Added to this were the intense pressures on supply generated by the internal demands described above. Thus, with the relaxation of controls in the second half of 1946 and their progressive removal during

1947, the latent pressures on prices became manifest and a sharp advance in the price level took place. Between June 1946 and December 1947, the wholesale price index rose by 28.4 per cent and the consumer price index by 18.1 per cent. Demand continued to press capacity throughout most of 1948, while the impact of rising import prices continued strong. Removal of the Canadian export embargoes on coarse grains, cattle and beef exposed Canada's agricultural supplies more fully to the influence of the high United States price level. However,

MAJOR PRICE TRENDS

1949=100



toward the end of 1948 there appears to have been a slackening of the pressure on prices and by 1949 supply and demand forces were once again coming into balance; in particular, external influences eased their upward pressures on the Canadian price level. Thus, between January and December 1949, the wholesale price index declined by 1.8 per cent, while the consumer price index rose by only 0.7 per cent. However, prices were firming in the first half of 1950, and this upward tendency was greatly intensified by the outbreak of hostilities in Korea in June of that year. The latter development gave rise to strong new domestic and external demands as indicated above, and touched off a further round of rapidly rising prices which was world-wide in scope. By mid-year 1951, however, demand was subsiding again, and wholesale prices had begun to fall. By the first quarter of 1952, most major price

indicators were moving downward and these declines continued throughout the year.

Sub-Division of Period From 1947 to 1952

The post-war period from 1947 to 1952 may be conveniently viewed in three separate phases: the period of reconversion and transition to a peace economy ending in 1948, which was characterized by powerful economic pressures coming from the demand side, the progressive relaxation of controls, and rapidly-rising prices; the period 1949 to the second quarter of 1950, during which supply and demand forces achieved a more balanced relationship and inflationary pressures subsided; and the period from mid-year 1950 to 1952, during which the influences set in motion by the outbreak of hostilities in Korea were dominant.

END OF RECONVERSION AND TRANSITION, 1947-1948

Emerging Peacetime Pattern in 1947

Gross domestic investment in new construction, machinery and equipment rose steadily throughout 1947, and, for the year as a whole, was 52 per cent above the year 1946. Investment expenditures on new machinery and equipment, in particular, showed large increases amounting to 74 per cent of the previous year. The demand for housing was also heavy, with an increase of 36 per cent over 1946, and this percentage rise was almost matched by the gain in new non-residential construction. At the same time the large build-up of business inventories continued throughout the year, being concentrated mainly in the manufacturing, retail and wholesale trade group. To a large extent, however, these rapid gains in gross domestic investment in construction, machinery, equipment and inventories reflected price increases, but the expansion in volume for the year as a whole was nevertheless considerable, 31.4 per cent above 1946.

The substantial rise in personal expenditure on consumer goods and services in 1947, amounting to 15 per cent by comparison with 1946, was quite steady throughout the year. In current dollars, durable goods purchases rose by 44 per cent above 1946. It should be noted, however, that volume-wise, gains in total consumer spending and durable goods purchases were considerably smaller than the value figures indicate, since prices were rising rapidly in this period. For the year as a whole, the volume of total consumer expenditure showed a gain of about 5 per cent over 1946.

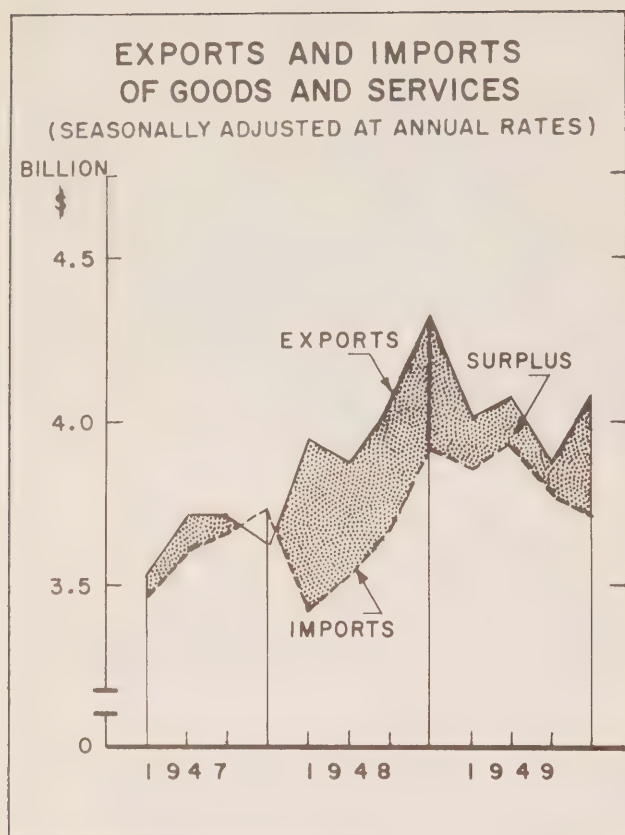
Government expenditure on goods and services continued its decline into the second quarter of 1947, as carryovers on federal wartime commitments were liquidated. By mid-year, however, a post-war low had been reached and thereafter government expenditure began to move gradually upward, partly in response to rising outlays for capital construction

projects which had been deferred by the war. For 1947 as a whole government expenditure on goods and services was about 14 per cent below the previous year.

Exports of goods and services rose moderately in value for the year 1947, following the decline between 1945 and 1946. However, this rise between 1946 and 1947 was entirely due to price increases; in volume terms there was a moderate decline. Imports of goods and services, on the other hand, rose very sharply in value, by 26 per cent over the previous year; in physical terms, the rise was about 9 per cent. This large gain in imports in 1947 was a reflection of the heavy domestic demands discussed above.

Important changes took place in Canada's balance of payments situation in 1947. A large portion of Canadian exports in 1946 and 1947 had been financed by the extension of loans and grants abroad; in 1947, for example, 20 per cent of our commodity exports were financed in this way. At the same time, the buoyant levels of consumer expenditure and gross domestic investment in machinery and equipment and in inventory accumulation had evoked a vigorous flow of imports which required cash payment. As a result of these and other factors relating to capital outflows, Canada's exchange reserves fell by the end of 1947 to a critically low level. In November 1947, the federal government adopted a programme of import restrictions over a wide range of commodities, raised commodity taxes on goods having a high import content, and imposed further controls over dealings in foreign exchange.

The high and rising level of the nation's expenditure in 1947 generated successive increases in most components of the National Income. Wages and salaries, which account for two-thirds of the National Income, rose steadily throughout the year; average weekly earnings in the nine leading industries rose



by 16.7 per cent between January and December. Net income of non-farm unincorporated business also shared in the general quarter-to-quarter increases, while investment income advanced in the first two quarters, rose less than seasonally in the third and levelled off in the fourth quarter.

On balance, the year 1947 was one of rapid transition from a semi-demobilized economy to one geared to peacetime patterns of demand and production. The current dollar value of Gross National Product increased substantially and, if allowance is made for normal seasonal movements, increases in the value of production occurred without serious interruption. However, the rise in the value of Gross National Product of 14.5 per cent for the year as a whole was largely accounted for by price increases; in volume terms the increase in production was rather small. This volume gain was nevertheless the first of the increases in physical output to take place in the post-war period and contrasted sharply with 1945 and 1946, when declines occurred. Persistent shortages in the face of heavy demand (both at home and abroad), a general rise in world prices, difficulties accompanying reconversion, and the progressive relaxation of price controls throughout the year, were the main factors behind the rise in prices. From January to December 1947, the general index of wholesale prices rose from 145.4 to 180.2, a gain of 24 per cent; in the same period, the consumer's price index rose by 15 per cent.

End of Transition Phase in 1948

The year 1948 opened with inflationary pressures still prominent and the major price indexes showing sharp gains in the first quarter. Demand continued to press capacity throughout most of the year, but by the fourth quarter an easing of the situation was becoming apparent, with wholesale and retail prices showing a pronounced tendency to level off.

Investment in new construction¹, machinery and equipment continued to show marked increases in 1948, in physical terms as well as in current value. For the year as a whole, a value increase of 27 per cent above 1947 was recorded, while the volume gain was 12 per cent.

Following the substantial build-up of inventories which occurred in the previous two years, additions to stocks of business inventories were much smaller in 1948. The most notable decline in the rate of accumulation occurred in manufacturing, but the build-up in wholesale and retail trade also fell off sharply. In the first half of the year there was some net physical liquidation of business inventories, and throughout the remainder of 1948 the overall rate of accumulation was in general well below the levels of 1947.

The current value of personal expenditure on consumer goods and services rose by 10 per cent between 1947 and 1948, but this was entirely due to price increases; in physical terms there was a decline of 2 per cent. This decline in the volume of consumer purchasing in 1948 affected the entire year, with quarterly levels remaining consistently below those of the year 1947. While it is probable that exchange conservation measures, by limiting supplies of certain goods, exercised a restraining influence on consumer purchasing in 1948, there was also apparently some difficulty in consumers maintaining the previous volume of purchases while prices were rising more rapidly than money incomes².

Government expenditure on goods and services continued to increase throughout 1948, if account is taken of seasonal factors, but the rise was modest. In value terms a gain of 15 per cent occurred for the year as a whole; in volume terms, however, the gain was only about 3 per cent.

In the foreign sector, there was a decline of 12 per cent in the physical volume of imports between 1947 and 1948, although the current dollar value rose slightly. This development partly reflects the

1. Some discontinuity occurs in the new residential construction series between the first and second quarters of 1948. Veterans' rental housing, which is included with government expenditure on goods and services prior to the second quarter of 1948, is included with new-residential construction thereafter.

2. Between the fourth quarter of 1947 and the fourth quarter of 1948, the consumer price index rose by 11 per cent, while personal disposable income rose by only 7 per cent.

influence of emergency exchange conservation measures, but is probably also associated with the low rate of inventory accumulation which followed the heavy build-up in stocks in the previous years. In volume terms, the quarterly flow of imports was well below the previous year in all four quarters. The volume of exports, on the other hand, rose slightly above 1947, with all of the volume gain occurring in the last half of the year. The rise in the value of exports was quite substantial for the year as a whole, reflecting in part the lifting of Canadian export embargoes on coarse grains, cattle and beef.

Thus, throughout 1948, the quarterly volume of consumer expenditures, inventory accumulation, and imports were running at a lower level than in 1947. By contrast, the physical volume of exports, residential and non-residential construction, and investment in machinery and equipment were, in general, at a higher quarterly rate than in the previous year.

While inflationary pressures continued¹ throughout most of 1948, there was a pronounced levelling off in prices toward the end of the year. Between the third and fourth quarters, the rise in the general wholesale price index was only 2 per cent compared

with a rise of 7 per cent between the first and third quarters. Canadian farm products' prices were declining at the year's end. The strong sellers' market which had existed since the end of the war appeared to have weakened considerably in 1948, reflecting the attainment of a better balance between supply and demand. At the same time there was an easing off of external pressures on the Canadian price level.

Compensation of employees rose continuously throughout 1948, if allowance is made for the normal seasonal drop in the first quarter; average weekly earnings in the nine leading industries showed a further gain of 15.9 per cent between January and December. Accrued net income of farm operators was higher for the year as a whole. Investment income, seasonally adjusted, showed modest successive gains, after a slight decline in the second quarter.

For the year 1948 as a whole, the dollar value of Gross National Product was 13.4 per cent above 1947, and about 3 per cent higher in terms of physical volume. This increase in physical terms compares with a rise of only 1 per cent between 1946 and 1947.

STABILITY AT HIGH PRODUCTION LEVELS, 1949 TO MID-YEAR 1950

The second period of Canada's post-war development, 1949 to mid-year 1950, was, in general, one of comparative price stability, accompanied by a high level of production, employment and income. The excessive demands of the previous few years had given way to a more balanced pattern in relation to the supply of goods and services. However, the outbreak of hostilities in Korea in June 1950 markedly altered the balance of economic forces and touched off a further round of inflation which carried the economy into its third post-war phase.

Supply and Demand in Balance, 1949

In 1949, the coming into balance of supply and demand forces which became apparent toward the end of the previous year continued. The year opened with prices tending downward. Although the general level of prices for the year as a whole was considerably above the average for 1948, there were no important price increases during the year. Farm and wholesale prices showed declines between January and December 1949, while the consumer price index rose only fractionally. External influences were easing their upward pressures on the Canadian price level and both import and export prices were relatively steady during the year.

A notable feature of the year 1949 was the levelling off in the quarterly rate of expenditure for fixed investment in durable assets. This development is apparent even on examination of the unadjusted data, but can be seen more clearly by eliminating the effects of normal seasonal factors. On a seasonally adjusted basis, quarter-to-quarter outlays for durable capital assets had risen almost steadily since the beginning of 1947, but by the beginning of 1949 the strong upward trend had apparently slackened. Housing expenditures remained level through 1949 if allowance is made for the influence of the usual seasonal factors. The rate of growth in new non-residential construction also slowed down markedly, while the seasonally adjusted figures of investment in new machinery and equipment showed some declines. For the year as a whole, the value and volume gains in investment expenditures were considerably less than in the two preceding years.

Additions to business inventories in 1949 were concentrated in the first half of the year; for the year as a whole, the build-up of inventories was moderate.

Stimulated by special payments in the form of refundable taxes, large grain equalization and adjustment payments, and by reduction in income taxes, consumer expenditures in 1949 rose very substantially; since prices were stable, the rise in volume terms was also quite considerable. In the first quarter, the volume of consumer buying was about the same as in the corresponding period of 1948, but it rose sharply in the second quarter and remained

1. The removal of Canadian export embargoes on coarse grains, cattle and beef in 1948 were a contributing factor to the rise in prices; Canada's agricultural supplies and prices were thereby more fully exposed to the influence of the higher United States price level.

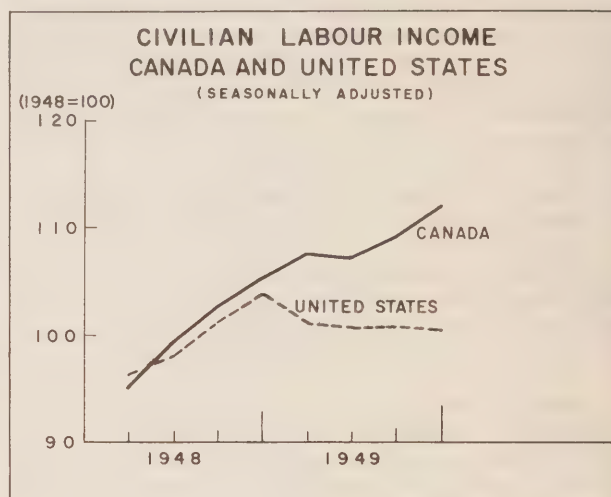
at a high level; for the balance of the year 1949, the volume of consumer spending was well above that of the previous year.

There was some decline in the value and volume of exports of goods and services in 1949; in volume terms, the quarterly flow of exports was consistently below that of the previous year. On the other hand, the value and volume of imports showed a moderate rise over 1948, with the gains occurring in the first three quarters of the year. For the year as a whole, there was a modest surplus on overall current account¹.

It is interesting to compare economic developments in Canada in 1949 with those in the United States, where a mild recession was underway. Business investment in plant and equipment and residential construction were falling off in the United States in the first half of the year, but the major setback occurred in the inventory sector which shifted from a position of net accumulation to one of fairly heavy liquidation. At the same time, consumer spending, after eliminating the effect of seasonal influences, remained relatively stable throughout the year. By contrast, in Canada, the build-up of physical stocks of business inventories was considerable throughout the first half of the year, although the rate was moderate for the year as a whole. Moreover, the value of consumer purchases in Canada, after allowing for seasonal factors, rose very sharply between the first and second quarters and remained at a high level for the remainder of the year. These two Canadian developments provided the main source of strength in the economy at a time when fixed investment expenditures in Canada were levelling off. Thus, Canada did not follow the United States into recession in the first half of 1949. As the accompanying chart shows, labour income continued to rise in Canada, though at a less rapid rate than in 1948, while the numbers of persons without jobs rose only moderately.

Although the Canadian economy did not experience the decline in National Income which accompanied economic developments in the United States in 1949, it is important to note that declines or slowing down in growth occurred in a number of the major income components during the year, reflecting in part the disappearance of inflationary pressures, and in part the general slowing down in the pace of industrial activity. The total of investment income, including corporation profits, showed a greater than seasonal decline in the first quarter and although the trend firmed somewhat in the second half of the year the level of investment income for 1949 was below that of the preceding year. The trend of net

income of non-farm unincorporated business was similarly downward if normal seasonal movements are taken into consideration, while, for the year as a whole, accrued net farm income was somewhat lower.



For the year 1949, as a whole, the value of Canada's Gross National Product increased by 5 per cent, while the volume of total output rose by approximately 3 per cent. However, Newfoundland is included for the first time in the figures of the year 1949, and somewhat less than one-half of the increase in volume of production is accounted for by this fact. It seems quite clear that the underlying economic forces which had generated a 3 per cent increase in the volume of total output in 1948 were somewhat less strong throughout the year 1949.

Developments in First Half of 1950

Economic developments in 1950 were dominated by two clearly marked upswings. While seasonal movements obscure the pattern in the unadjusted data, reference to the seasonally adjusted data more clearly reveals the basic underlying trends. The first upward movement occurred in the early part of the year when business expenditure on non-residential construction and machinery and equipment revived after the levelling off in 1949; the rate of the inventory build-up also increased. At the same time, personal expenditure on consumer goods and services continued the rise which began in the preceding year. The second upward movement took place in the latter half of 1950, following the outbreak of hostilities in Korea in June. This second advance was marked by powerful new pressures stemming from the demand side, and a resurgence of inflationary influences, both of which greatly altered the general economic outlook. These latter developments belong to the third phase of Canada's post-war economic experience, and are discussed in a later section.

1. It may be observed in passing that in September 1949, many countries having important trade relations with Canada devalued their currencies by approximately 30 per cent, and Canada followed with a 10 per cent devaluation in terms of the United States dollar. The effect of these actions is more readily discernible in the aggregate figures of the first quarter of 1950, than in the fourth quarter of 1949.

At the beginning of 1950, the proportion of the labour force seeking work in Canada was higher than at any time in the post-war period, amounting to 6 per cent of the total. This development was largely regional and was concentrated to a large extent in the forestry industry; it reflected in part the adverse weather conditions of the winter of 1949-50 which had seriously interfered with logging operations in British Columbia, and in part, the cut-back in purchases of forest products by the United Kingdom. Elsewhere in the economy there were indications that a general strengthening of activity was beginning to get under way.

When allowance is made for seasonal factors, a pronounced pickup may be noted in the first quarter of the year in the rate of business outlay for new durable assets and inventories, although expenditure on housing remained at the level prevailing in the previous year. The trend of consumer expenditures was also upward in the first quarter. In line with the general strengthening of these demand factors, imports of goods and services also began to rise, taking into account seasonal factors. On the other hand, there was a greater than seasonal decline in exports of goods and services, and a deficit on current account was incurred¹.

Although the value of the Gross National Product in the first quarter was at approximately the same rate as in the last quarter of the previous year, the pickup in business and consumer expenditures noted above appears to reflect an underlying expansionary tendency. This upward tendency was reinforced in the second quarter by an even greater upswing in consumer expenditures, and by a rise in exports of goods and services. Gross domestic investment in durable assets, excluding housing, also showed larger than seasonal increases, while the moderate rate of inventory accumulation continued. Imports of goods and services continued to rise, and despite the improvement in Canada's export trade, a further deficit was sustained on overall current account. On balance, a considerable increase occurred in Gross National Product in the second quarter.

From the foregoing brief review, it will be clear that the rise in Gross National Product which is shown for the year 1950 as a whole, was well underway before the outbreak of the conflict in Korea in June. In the first half of the year, most components of the National Income were moving upward. It may be noted too that, while inflationary pressure became severe after the outbreak of hostilities in Korea, prices were rising moderately in the second quarter.

THE ECONOMY, MID-1950 TO 1952

The third phase of Canada's post-war economic experience begins logically with the outbreak of the Korean conflict in June 1950. This marked the beginning of the adjustment to a defence economy and the renewal of inflationary pressures. The review which follows discusses the quarterly data of this period within the context of the annual figures. However, it is important to note that three fairly clear-cut stages are discernible in this third phase of Canada's post-war development, and these overlap the divisions of the annual data. Each stage is characterized by a significant difference in the pattern and strength of final demand, with the change occurring within the calendar year.

The first stage, covering the period mid-1950 to about mid-1951, was one of heavy abnormal demands for consumer goods and business inventories, based on fears of shortages and expectations of higher prices. In this period, defence expenditures played

a limited, though increasingly important role, with the rearmanent programme mainly in the preparatory stage. Prices rose very rapidly.

The second stage begins broadly about the middle of 1951, when a reaction to this heavy forward buying apparently set in and these inflated consumer and business demands subsided against a background of anti-inflationary measures enacted by the Federal Government; the volume of housing also fell off sharply. The major expansionary elements in the economy in this period were a growing volume of requirements for defence, investment in non-residential construction, machinery and equipment, and exports. The strong inflationary influences of the immediate post-Korean period were beginning to subside in this second stage, and by early 1952, the downward trend of prices had become general.

A third pattern is discernible beginning early in 1952, when a strong revival of consumer purchasing and a sharp upturn in housing outlays were superimposed on the growing volume of expenditures in other sectors. By the middle of 1952, the volume of consumer purchasing was once again exerting an important expansionary influence, based on the increase in "real" income which had been achieved since the beginning of the year, while housing outlays were continuing to rise. The trend of prices was downward throughout the year.

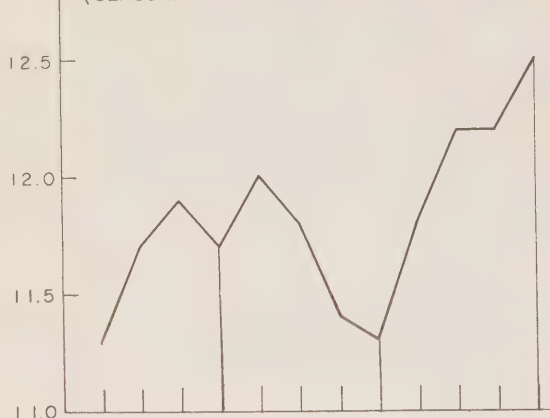
These three stages in the changing pattern of demand in the post-Korean period are among the more significant features of the review that follows.

1. This was the beginning of a series of deficits which continued until the fourth quarter of 1951. The largest deficits occurred after the outbreak of the conflict in Korea in mid-1950; the volume of imports rose more sharply than the volume of exports, while there was some deterioration in the terms of trade. Among the factors associated with the deficits in the first half of 1950 (which were considerably smaller than the post-Korean deficits) may be mentioned the attempt of sterling area countries to reduce their dollar purchases following the devaluation of 1949, the improved competitive position of sterling countries in the Canadian market, the successive relaxation of exchange conservation measures, and higher payments for services.

CHANGES IN SELECTED ITEMS, 1950-1952

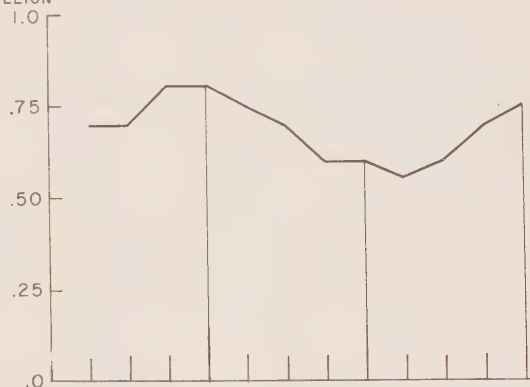
CONSTANT '49 DOLLARS
BILLION

VOLUME OF PERSONAL CONSUMPTION (SEASONALLY ADJUSTED AT ANNUAL RATES)



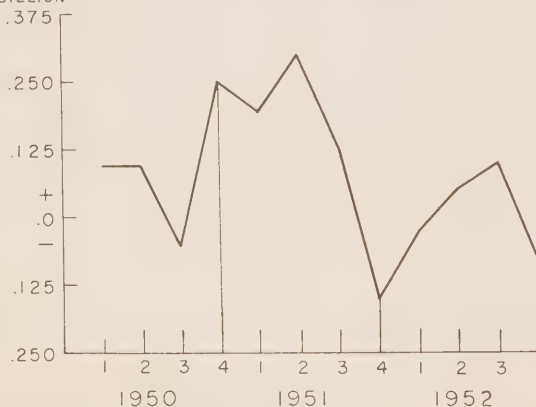
VOLUME OF NEW RESIDENTIAL CONSTRUCTION (SEASONALLY ADJUSTED AT ANNUAL RATES)

CONSTANT '49 DOLLARS
BILLION



CHANGE IN VOLUME OF BUSINESS INVENTORIES (QUARTERLY FIGURES NOT SEASONALLY ADJUSTED)

CONSTANT '49 DOLLARS
BILLION



Developments in the Latter Half of 1950

The outbreak of the conflict in Korea was followed by an upswing of demand in most sectors of the economy. In particular, the total of consumer expenditure in the third quarter, both before and after adjustment for seasonality, rose sharply above the already high levels of the second quarter; the increase in durable goods purchases was especially noteworthy. This strong upsurge in consumer spending was apparently associated with a splurge of precautionary buying in anticipation of supply difficulties and higher prices. Substantial increases are also shown for expenditures on housing, non-residential construction, and new machinery and equipment, if seasonal factors are accounted for. Exports rose only seasonally, but imports showed a substantial gain and the deficit on current account was continued. In contrast to the above increases, there appears to have been some liquidation of inventories in the third quarter¹.

It may be noted that a development of importance in the field of international finance in the third quarter was the freeing of the Canadian dollar on September 30, following the heavy influx of speculative capital into Canada.

The major feature of the fourth quarter of 1950 was the huge accumulation of inventories. This movement into inventories was, in part, a consequence of expectations of shortages and higher prices in the setting of a highly uncertain international situation. At the same time, the level of personal expenditure remained very high. Housing expenditures, seasonally adjusted, continued to increase, but outlay on non-residential construction remained level; expenditures on new machinery and equipment declined. Exports increased more than seasonally, while imports continued their vigorous upward trend, and a deficit on current account was again incurred.

The price rise which accompanied the developments in the last two quarters of 1950 was worldwide, so that in addition to domestic pressures, Canadian prices were subject to the influence of a rapidly rising international price level. Between June and December 1950, the general index of wholesale prices rose by 8 per cent, while the consumer price index rose by 5 per cent.

A number of fiscal and economic measures designed to curb excessive spending and to release resources for the defence programme, were introduced in the fourth quarter of 1950. In October, the Bank of Canada raised its re-discount rate as a step in

1. It is difficult to assess with confidence the movement shown by inventories in the third quarter in view of the large residual error of estimate which is present. Moreover, the residual error changes abruptly from a large negative in the third quarter to a large positive in the following quarter. It is possible that a part of the inventories of the fourth quarter are properly assignable to the third quarter.

the direction of encouraging restraint over the volume of credit. In November, the government imposed direct controls over the use of consumer credit, and in December controls were established over the use of steel.

In summary, the most notable features of the year 1950 were the large investment in inventories, the increase in the volume of consumer spending, the sharp rise in imports of goods and services relative to exports, and the rise in the price level. The deficit which was incurred on current account was the first since 1944. Most elements of the National Income showed major gains, with investment income advancing much more rapidly than other income components. The national output increased by approximately 6 per cent in physical volume, the largest increase in any of the postwar years up to that time, while the value of total output rose by about 11 per cent.

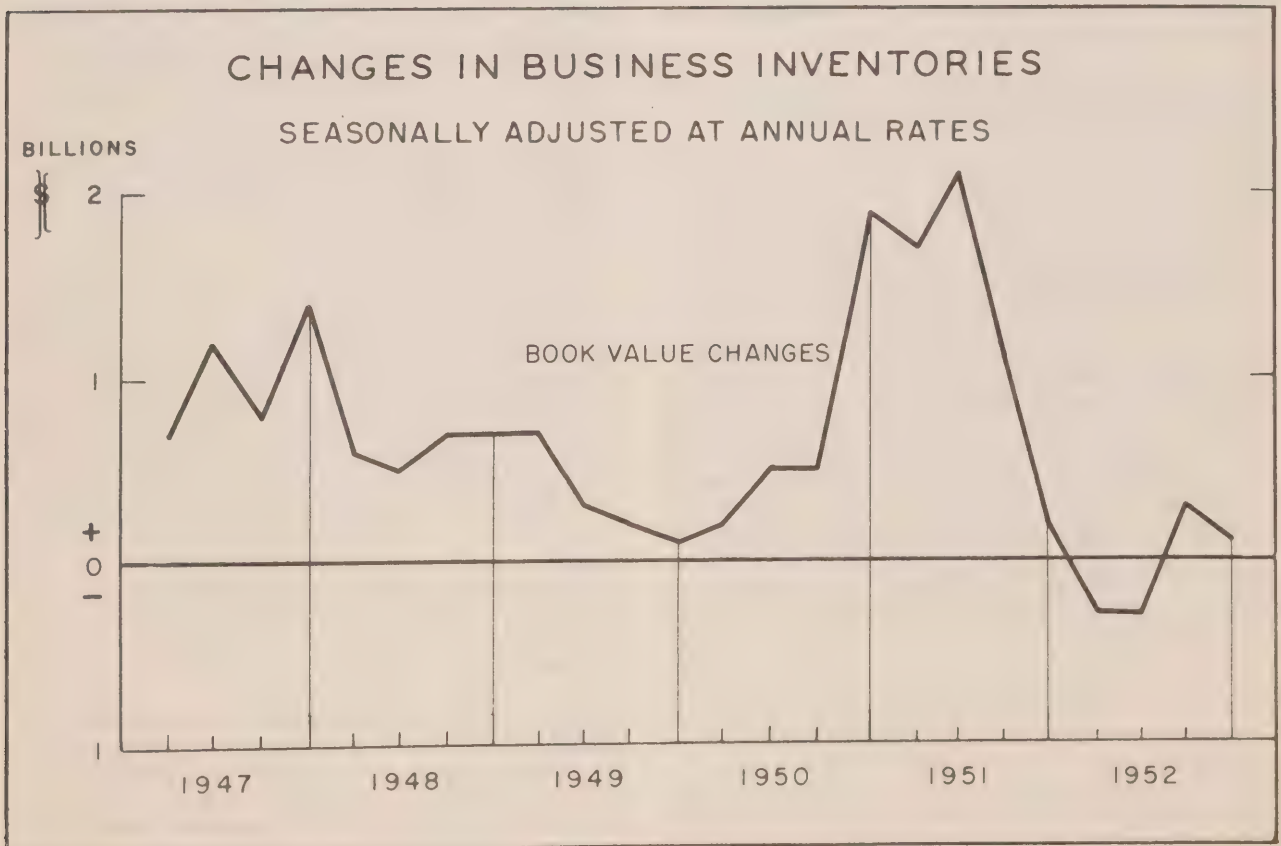
Adjustment to a Defence Economy, 1951

The year 1951 was, in general, one of rapid accommodation to the requirements of the developing defence programme, in a highly inflationary setting. The remarkable flexibility and productivity of the economy is demonstrated by the fact that by the

end of the year inflationary pressures were subsiding, and resources were becoming increasingly available over and above defence requirements.

Developments during the year were largely conditioned by the defence programme and the various economic and fiscal measures required to re-direct resources to defence preparedness and to curb inflationary pressures. The fall Budget of 1950 had provided for substantially increased defence commitments. The later Budget of April 1951 provided for defence expenditures totalling \$1.7 billion. This large expansion programme, superimposed upon an economy operating close to its productive capacity and in which demand pressures were already severe, called for more stringent measures to divert resources from less essential uses and to ease the pressures on the price level. In these circumstances, the government followed a strict "pay-as-you-go" policy in financing the new defence programme. To this end, in April, it raised taxes on personal and corporation incomes and imposed new and higher taxes on consumer durable goods. A further measure aimed at discouraging non-essential investment projects provided for the deferment for income tax purposes of depreciation allowed on capital expenditures except in certain specified circumstances.

Supplementing these budgetary measures, it was agreed in February at a meeting of the Bank of Canada and the general managers of the chartered



banks that an effort should be made (which proved broadly successful) to avoid further expansion of bank credit during 1951. In March, steps were taken by the federal government to stiffen the existing consumer credit regulations by raising down payments and reducing the time-limit for completion of payment. At the same time, the interest rate to borrowers on government-assisted residential housing mortgages was raised, and down-payment requirements were increased. Throughout the year controls were extended over the use of steel, aluminum, copper, brass and nickel, and the direct allocation of these materials for defence projects was established.

These developments had an important effect on the movements of the basic components of Gross National Expenditure in 1951. At the same time, as the year progressed, it appears that an easier market psychology was beginning to develop, both domestically and abroad, with demand factors subsiding to more normal levels. This situation seems to have been a reaction to the heavy forward buying of the initial post-Korean period; in addition, expectations of shortages, which were exerting an important influence on demand immediately after Korea, had not materialized to the extent anticipated. By mid-year 1951, the high rate of inventory accumulation had fallen off, and the volume of consumer purchasing had dropped below the level of the previous year. World prices of many primary commodities, which had been bid up to extreme levels, fell sharply as demands became more normal. The middle of 1951 thus marked the beginning of a second stage in the post-Korean period.

As the year 1951 opened, a second wave of precautionary buying appeared to be under way following a deterioration of the military situation in Korea late in 1950. Personal expenditure on consumer goods and services, seasonally adjusted, rose by 6 per cent between the fourth quarter of 1950 and the first quarter of 1951, and durable goods purchases showed a gain of 20 per cent. The inventory build-up continued at a heavy pace, particularly in the retail trade group. At the same time, the rate of expenditure on non-residential construction and new machinery and equipment, seasonally adjusted, showed a large gain, although outlay for new housing remained level. The trend of both exports and imports, seasonally adjusted, was also strongly upward, but imports continued to rise at a faster rate, and there was a substantial deficit on current account. To a large extent, the above increases reflect the rapid price rise of the period; but the gain in imports in real terms was also very substantial, when allowance is made for seasonal factors.

By the second quarter of 1951, a reaction to the heavy precautionary buying of the preceding quarters was apparently in progress. Anticipated shortages had not materialized to the extent expected, many consumers had over-bought, and anti-inflationary measures of the government were contributing to the easing of demand. The value of

consumer expenditure, seasonally adjusted, rose moderately in the second quarter, but when price changes are taken into consideration there was a decline in volume. This decline in the volume of consumer buying continued throughout the third and fourth quarters of 1951, after accounting for seasonal factors. In the case of durable goods purchases, both the value and volume figures, seasonally adjusted, showed very noteworthy declines after the peak reached in the first quarter; from the first to fourth quarter, the value drop was 35 per cent and the volume drop was 39 per cent.

**Volume of Personal Expenditure
(1949 constant \$) Seasonally
Adjusted at Annual Rates**

	1951			
	1	2	3	4
	\$ (billion)			
Personal Expenditure on Consumer Goods and Services	12.0	11.8	11.4	11.3
Durable Goods	1.5	1.3	1.0	.9

An interesting feature of these developments in 1951 was the recovery of personal saving to levels more closely approximating those which prevailed prior to the Korean conflict. In the latter half of 1950 and the early part of 1951, the proportion of personal saving (excluding farm inventories) to disposable income was well below the average for the years 1948 and 1949, reflecting the heavy consumer buying splurge which followed the outbreak of hostilities in Korea. As 1951 progressed, however, and as consumer buying turned downwards, the ratio of personal saving (excluding farm inventories) to disposable income rose again and remained high throughout the following year.

The severe drop in the volume of consumer purchases (seasonally adjusted) in the latter half of 1951 was also accompanied by a significant change in the direction of business inventory movements. The volume build-up of retail and wholesale stocks in the first half of the year gave way in the last half to some net liquidation as consumer purchasing declined and overbuilt stocks were worked off. The growth in the volume of manufacturing stocks, which was substantial in the second and third quarters, was smaller in the fourth quarter. As a result of these movements, the volume of business inventories, in the last quarter of 1951 showed a substantial net liquidation, in contrast to the heavy build-up earlier in the year.

New residential construction, seasonally adjusted, showed a steep decline after the first quarter of 1951, although again the unadjusted series reflect the effects of seasonal influences. If seasonal factors are taken into account, this decline continued unchecked until the first quarter of 1952,

in which period the volume of new housing put in place was well below that of any quarter since the beginning of 1948.

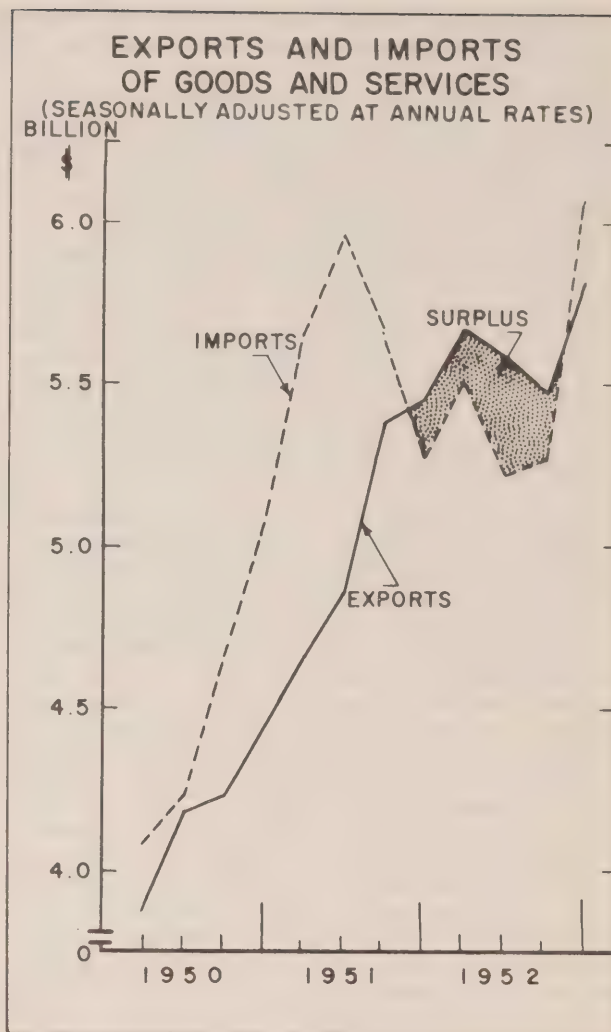
Thus, by the middle of 1951, a new pattern in final demand had emerged, with consumer expenditure and outlay for housing falling off, and the rate of the inventory build-up slowing down sharply.

In contrast to the declines noted above, expenditures on new non-residential construction, seasonally adjusted, continued to rise in the second and third quarters, but levelled off in the fourth. The rise was accompanied by a shift in the structure of this component, with the defence-supporting industries receiving a larger share of the resources absorbed. This development was associated with the deferred depreciation regulations and the controls over the use of steel and other strategic materials. On a seasonally adjusted basis, business expenditures on new machinery and equipment also rose in the second and third quarters of the year, but declined in the fourth quarter.

Government expenditure on goods and services, which had begun to rise moderately in the latter part of 1950, continued to grow at an accelerated pace in 1951. Between the fourth quarter of 1950 and the fourth quarter of 1951, the annual rate of government expenditure rose from \$2.6 billion to \$3.7 billion. Defence expenditures accounted for the greater part of this increase, rising during the period from \$0.5 billion at annual rates to \$1.3 billion. Of the total Gross National Expenditure, defence outlays were taking 2.9 per cent in the fourth quarter of 1950 and 6.1 per cent in the fourth quarter of 1951.

The value and volume of imports of goods and services, seasonally adjusted, reached a peak in the second quarter of 1951, but dropped sharply in the last half of the year. These declines were associated with the falling off of consumer purchases of many products having a high import content, and with the severe decline in the overall rate of inventory accumulation in the latter part of the year. On the other hand, both the value and volume of exports of goods and services, seasonally adjusted, showed a progressive rise throughout the year. By the fourth quarter of the year, the two-year deficit in current international account had been superseded by the emergence of a surplus. For the year as a whole, however, the net deficit was greater than in 1950.

These divergent movements in the main components of Gross National Expenditure in 1951 took place in a setting in which prices of many major groups were rising rapidly. Consumer prices and farm prices of agricultural products rose steadily throughout most of the year. It is notable, however, that by mid-year 1951 the general index of wholesale prices had begun to fall as world prices declined; but export prices continued their upward trend. By early 1952, the downward trend of prices had become general, with almost all major indicators



showing a decline in the first quarter. The middle of 1951 thus also marked the first turning point in the post-Korean price rise, to be followed later by general declines in the entire price structure.

The Gross National Product in 1951 was 18 per cent above that of 1950 by value and about 6 per cent higher in terms of real physical output. However, these increases did not take place at a steady rate throughout the year. Most components of the National Income, seasonally adjusted, rose sharply in the first part of the year but showed divergent tendencies in the latter half. Investment income, in particular fell steeply after the second quarter and the rate of growth in labour income slowed down. The large grain crop and rising farm prices lifted accrued net farm income to record levels, but net income of unincorporated business proprietors showed little change over the year.

Balanced Growth in 1952

As the adjustment to a defence economy progressed, the sharply divergent movements which characterized the year 1951 were superseded by

the emergence of a more normal pattern of production and demand. This development was a reflection of the increasing availability of resources over and above the requirements of the defence programme. By the beginning of 1952 a number of the major expenditure groups which showed signs of weakening toward the latter part of 1951, had turned upward, and this expansion continued without important interruption in most groups throughout succeeding quarters. Associated with this development, a number of key factors stand out as highlights of the year's economic activity; the abatement of inflationary pressures and the improvement in the supply of essential materials; the surplus on current account, in contrast to the deficit of the previous year; and the emergence of an exchange premium on the value of the Canadian dollar in terms of the United States dollar.

It will be useful to review the chronology of events which serve as a backdrop to the year's activity. In January 1952, consumer credit regulations were relaxed and in May they were removed completely. In May, also, the Bank of Canada expressed the view to the chartered banks that the special policies of credit restraint which had been agreed upon in February 1951 were no longer necessary. Increases in steel producing capacity and supplies of other critical materials made possible substantial reductions in excise taxes on consumer durable goods in the Budget of April 8, 1952. Throughout the year, the Department of Defence Production progressively removed controls over certain essential materials as they came into better supply. The outbreak of foot and mouth disease in Saskatchewan in February 1952 seriously disrupted the livestock industry throughout the year and resulted in the temporary loss of the United States market; the wheat crop was the largest on record.

The more balanced growth in the total level of effective demand which was the key factor of the year was highlighted by the sharp rise in seasonally adjusted personal expenditure on consumer goods and services which began in the first quarter. Throughout most of 1951 the rate of consumer purchasing, particularly in the durable goods group, had been slowing down, and in volume terms very substantial declines had occurred. Beginning with the first quarter of 1952, however, this trend was reversed and a very large value and volume gain occurred. (See Chart, p. 22.) This revival in consumer spending continued throughout the year and was one of the chief factors contributing to the expansion in production; most notable gains occurred in the durable goods group. Associated with this development, a very substantial rise in "real" income was taking place in 1952, while early in the year consumer credit regulations and the special excise taxes on durables had been withdrawn. It is interesting too, to note that in 1952 the recovery of consumer spending was not accompanied by any appreciable drop in the ratio of personal saving (excluding farm inventories) to disposable income. It appears that the high level of consumer spending

in 1952 was being supported by the increases in real income, rather than by a decline in the personal savings ratio.

**Volume of Personal Expenditure
(1949 constant \$) Seasonally
Adjusted at Annual Rates**

	1951	1952			
	4Q	1Q	2Q	3Q	4Q
	\$ (billion)				
Personal Expenditure on Consumer Goods and Services	11.3	11.8	12.2	12.2	12.5
Durable Goods9	1.2	1.4	1.3	1.4

The resumption in the growth of consumer spending in 1952 was accompanied by another change in the direction of inventory movements. In the second and third quarters of the year there was a considerable accumulation in the volume of stocks in the wholesale and retail trade groups. This was in sharp contrast to the net liquidations in these groups in preceding quarters. Manufacturers' inventories, on the other hand, moved in a different manner. The heavy build-up of 1951 in the volume of manufacturers' stocks was followed in 1952 by net liquidations in the first three quarters of the year.

New residential construction, after reaching a low point in the first quarter of 1952, began to pick up in the second and rose continuously throughout the year. This reversal of the downward trend which began early in 1951 was related to a larger flow of institutional mortgage money, greater stability in house-building costs, and easier down payment requirements which came into effect towards the close of 1951.

From the foregoing, it will be seen that a third change in the overall pattern of demand was emerging in the early part of 1952, with the revival in consumer spending and outlays for new housing leading the way, accompanied by some build-up of inventories.

New non-residential construction, seasonally adjusted, continued to rise in 1952, with large gains recorded in the defence supporting groups. Investment in new machinery and equipment, which had begun to decline in the fourth quarter of 1951, continued to fall in the first quarter of 1952 if the effect of the normal seasonal increase is eliminated. An upswing occurred in the second and third quarters, but a further decline was registered in the last quarter of the year.

Government expenditure on goods and services continued to grow in 1952, with the main strength coming from defence outlays; by the fourth quarter, government expenditure was running at an annual rate of \$4.7 billion, with defence expenditures at around \$2.0 billion.

Both export and import prices declined throughout 1952, but at widely divergent rates. Import prices declined more rapidly than export prices so that there was a marked improvement in the terms of trade. The volume of imports increased somewhat more rapidly than the volume of exports, but the net effect of the volume and price movements was to yield a surplus on current international account in all four quarters of 1952. Thus, for the year as a whole, a substantial surplus was sustained, following the deficits of the two previous years.

The trend of prices throughout 1952 was downward. All of the major price indexes showed declines in the first quarter, and these declines, with minor exceptions, continued unbroken throughout the year. However, it should be noted that the decline in prices in 1952 reflected in the main the operation of two special circumstances: the fall in international commodity prices, and the sharp drop in the price of Canadian livestock products. The emergence of an exchange premium on the Canadian dollar was a contributing factor in reducing

import prices. The price of most domestically produced goods and services remained firm in 1952.

The value of Gross National Product in 1952 was 7 per cent above 1951, and about 6 per cent higher in terms of real physical output. At the same time, the incomes generated by this production showed fairly general quarter-to-quarter advances, on a seasonally adjusted basis. Labour income continued to rise, though somewhat less rapidly than in 1951; with prices falling, there was a substantial gain in "real" income. Investment income turned upward in the first quarter, following the down-turn in the latter part of 1951; for the year as a whole, investment income was somewhat higher than the preceding year. Net income of unincorporated business proprietors fell off in the first quarter but showed divergent movements thereafter to reach a total slightly above the year 1951. For the year as a whole the loss of the United States market for livestock and falling livestock prices, coupled with increased operating expenses, adversely affected the total of accrued net farm income; but these developments were partly offset by the largest grain crop on record.

PART I

TABLES

SECTION 1

QUARTERLY DATA UNADJUSTED FOR SEASONALITY

TABLE 1. National Income and Gross National Product, By Quarters, 1947-1952¹

No.		1947					1948				
		I	II	III	IV	Year	I	II	III	IV	Year
		(millions of dollars)									
1	Wages, Salaries and Supplementary Labour Income	1,431	1,506	1,602	1,682	6,221	1,638	1,740	1,873	1,919	7,170
2	Military Pay and Allowances	26	18	20	19	83	19	18	22	23	82
3	Investment Income	467	556	620	626	2,269	560	571	648	685	2,464
	Net Income of Unincorporated Business:										
4	Accrued Net Income of Farm Operators from Farm Production ²	55	168	827	173	1,223	47	66	1,214	191	1,518
5	Net Income of Non-farm Unincorporated Business ³	245	305	312	327	1,189	277	338	348	363	1,326
6	Net National Income At Factor Cost	2,224	2,553	3,381	2,827	10,985	2,541	2,733	4,105	3,181	12,560
7	Indirect Taxes Less Subsidies	368	391	399	446	1,604	428	435	444	465	1,772
8	Depreciation Allowances and Similar Business Costs	239	258	297	324	1,118	283	299	333	361	1,276
9	Residual Error of Estimate	+5	-12	+2	+66	+61	-20	+4	-4	+25	+5
10	Gross National Product At Market Prices	2,836	3,190	4,079	3,663	13,768	3,232	3,471	4,878	4,032	15,613
11	<i>Gross National Product At Market Prices (excluding accrued net income of farm operators from farm production)</i>	<i>2,781</i>	<i>3,022</i>	<i>3,252</i>	<i>3,490</i>	<i>12,545</i>	<i>3,185</i>	<i>3,405</i>	<i>3,664</i>	<i>3,841</i>	<i>14,095</i>

1. Includes Newfoundland in 1949 and all subsequent years throughout this publication.

2. This item includes the undistributed earnings of the Canadian Wheat Board, and an inventory valuation adjustment for grain in Wheat Board channels.

3. Includes net income of independent professional practitioners.

TABLE 2. Gross National Expenditure, By Quarters, 1947-1952

No.		1947					1948				
		I	II	III	IV	Year	I	II	III	IV	Year
		(millions of dollars)									
1	Personal Expenditure on Consumer Goods and Services	2,000	2,220	2,278	2,675	9,173	2,240	2,458	2,481	2,933	10,112
2	Government Expenditure on Goods and Services ^{1,4}	438	313	401	418	1,570	442	352	493	511	1,798
	Gross Domestic Investment: ²										
3	New Residential Construction	76	138	143	149	506	78	175	195	189	637
4	New Non-Residential Construction	107	137	172	183	599	155	186	236	241	818
5	New Machinery and Equipment.....	214	262	256	284	1,016	292	333	280	325	1,230
6	Change in Inventories.....	26	152	754	15	947	-104	-25	1,008	-274	605
7	<i>Business Inventories only</i> ³	<i>228</i>	<i>264</i>	<i>193</i>	<i>317</i>	<i>1,002</i>	<i>189</i>	<i>100</i>	<i>192</i>	<i>139</i>	<i>620</i>
8	Exports of Goods and Services	781	927	984	946	3,638	867	965	1,095	1,127	4,054
9	Deduct: Imports of Goods and Services	-802	-971	-907	-941	-3,621	-759	-969	-913	-995	-3,636
10	Residual Error of Estimate	-4	+12	-2	-66	-60	+21	-4	+3	-25	-5
11	Gross National Expenditure At Market Prices	2,836	3,190	4,079	3,663	13,768	3,232	3,471	4,878	4,032	15,613

1. Includes outlay on new durable assets such as building and highway construction by governments, other than government business enterprises. Also includes the change in inventories of government commodity agencies.

2. Includes capital expenditures by private and government business enterprises, private non-commercial institutions, and outlays by individuals on new residential construction.

3. Excludes change in farm inventories and grain in commercial channels

TABLE 1. National Income and Gross National Product, By Quarters, 1947-1952¹

1949					1950					1951					1952					No.
I	II	III	IV	Year	I	II	III	IV	Year	I	II	III	IV	Year	I	II	III	IV	Year	
(millions of dollars)																				
1,843	1,911	1,996	2,011	7,761	1,915	2,023	2,138	2,235	8,311	2,218	2,376	2,500	2,582	9,676	2,540	2,611	2,752	2,840	10,743	1
26	30	30	29	115	32	30	36	39	137	41	48	54	58	201	60	67	69	74	270	2
554	566	646	679	2,445	586	730	979	860	3,155	865	1,012	937	828	3,642	799	969	993	905	3,666	3
96	192	979	237	1,504	63	192	1,070	178	1,503	132	328	1,416	230	2,106	152	110	1,439	233	1,934	4
293	351	364	361	1,369	293	364	387	400	1,444	334	384	387	398	1,503	306	392	401	423	1,522	5
2,812	3,050	4,015	3,317	13,194	2,889	3,339	4,610	3,712	14,550	3,590	4,148	5,294	4,096	17,128	3,857	4,149	5,654	4,475	18,135	6
441	449	466	474	1,830	453	484	514	567	2,018	590	575	645	658	2,468	637	657	692	701	2,687	7
323	341	375	398	1,437	369	395	418	454	1,636	433	463	476	517	1,889	476	509	527	558	2,070	8
-6	-10	+32	-15	+1	—	+13	-82	+68	-1	+6	-45	-16	+20	-35	+15	+20	+19	+65	+119	9
3,570	3,830	4,888	4,174	16,462	3,711	4,231	5,460	4,801	18,203	4,619	5,141	6,399	5,291	21,450	4,985	5,335	6,892	5,799	23,011	10
3,474	3,638	3,909	3,937	14,958	3,648	4,039	4,390	4,623	16,700	4,487	4,813	4,983	5,061	19,344	4,833	5,225	5,453	5,566	21,077	11

TABLE 2. Gross National Expenditure, By Quarters, 1947-1952

1949					1950					1951					1952					No.
I	II	III	IV	Year	I	II	III	IV	Year	I	II	III	IV	Year	I	II	III	IV	Year	
(millions of dollars)																				
2,401	2,752	2,706	3,104	10,963	2,616	2,972	3,008	3,433	12,029	3,042	3,302	3,231	3,722	13,297	3,219	3,575	3,487	4,053	14,334	1
505	433	596	594	2,128	591	460	625	650	2,326	718	630	941	923	3,212	1,082	857	1,090	1,187	4,216	2
140	206	207	189	742	140	204	233	224	801	165	222	208	186	781	130	206	229	238	803	3
183	214	257	249	903	189	243	305	289	1,026	238	306	371	345	1,260	284	358	433	401	1,476	4
331	370	310	312	1,323	324	383	342	340	1,389	415	495	437	422	1,769	425	547	452	435	1,859	5
-12	-84	737	-410	231	-107	86	879	102	960	281	496	1,263	-420	1,620	-173	-227	1,150	-472	278	6
225	44	71	-21	319	120	187	88	374	769	478	607	242	-60	1,267	-10	-9	47	-79	-51	7
877	1,022	1,044	1,068	4,011	852	1,045	1,124	1,162	4,183	1,024	1,209	1,416	1,440	5,089	1,238	1,411	1,428	1,504	5,581	8
-862	1,092	-936	-947	-3,837	-895	-1,149	-1,137	-1,332	-4,513	-1,259	-1,563	-1,484	-1,307	-5,613	-1,205	-1,372	-1,357	-1,483	-5,417	9
+7	+9	-33	+15	-2	+1	-13	+81	-67	+2	-5	+44	+16	-20	+35	-15	-20	-20	-64	-119	10
3,570	3,830	4,888	4,174	16,462	3,711	4,231	5,460	4,801	18,203	4,619	5,141	6,399	5,291	21,450	4,985	5,335	6,892	5,799	23,011	11

4. Federal defence expenditures, included with Government Expenditure on Goods and Services (Table 2, line 2), are as follows for the years 1949 to 1952:

1949					1950					1951					1952				
I	II	III	IV	Year	I	II	III	IV	Year	I	II	III	IV	Year	I	II	III	IV	Year
95	74	87	105	361	136	108	112	137	493	219	238	361	325	1,143	538	384	410	500	1,832

TABLE 3. Sources of Personal Income, by Quarters, 1947- 1952

No.		1947					1948				
		I	II	III	IV	Year	I	II	III	IV	Year
		(millions of dollars)									
1	Wages, Salaries and Supplementary Labor Income	1,431	1,506	1,602	1,682	6,221	1,638	1,740	1,873	1,919	7,170
2	Deduct: Employer and Employee Contributions to Social Insurance and Government Pension Funds	-46	-39	-46	-50	-181	-57	-52	-57	-58	-224
3	Military Pay and Allowances.....	26	18	20	19	83	19	18	22	23	82
4	Net Income Received by Farm Operators from Farm Production ¹	34	132	812	183	1,161	9	273	1,205	140	1,627
5	Net Income of Non-farm Unincorporated Business	245	305	312	327	1,189	277	338	348	363	1,326
6	Interest, Dividends and Net Rental Income of Persons ²	219	266	253	305	1,043	252	259	259	288	1,058
	Transfer Payments to Persons:										
7	From Government (excluding interest)	235	218	189	197	839	247	212	198	206	863
8	Charitable Contributions by Corporations	4	4	4	5	17	5	6	5	5	22
9	Net Bad Debt Losses of Corporations	4	4	5	5	18	4	4	5	5	19
10	Personal Income	2,152	2,414	3,151	2,673	10,390	2,394	2,798	3,858	2,893	11,943

1. This item differs from line 4 of Table 1 in that it excludes undistributed earnings (and the inventory valuation adjustment) of the Canadian Wheat Board.

2. Includes all government debt interest paid to persons.

TABLE 4. Disposition of Personal Income, by Quarters, 1947-1952

No.		1947					1948				
		I	II	III	IV	Year	I	II	III	IV	Year
		(millions of dollars)									
1	Income Taxes	164	274	137	120	695	143	267	149	158	717
2	Succession Duties	15	15	17	14	61	17	16	14	11	58
3	Miscellaneous.....	13	9	6	7	35	16	11	9	11	47
4	Total Personal Direct Taxes	192	-298	160	141	791	176	294	172	180	822
5	Non-durable Goods.....	1,204	1,369	1,471	1,732	5,776	1,367	1,540	1,637	1,917	6,461
6	Durable Goods	173	208	210	261	852	189	229	212	284	914
7	Services ¹	623	643	597	682	2,545	684	689	632	732	2,737
8	Total Personal Expenditure on Consumer Goods and Services	2,000	2,220	2,278	2,675	9,173	2,240	2,458	2,481	2,933	10,112
9	Personal Saving	-40	-104	713	-143	426	-22	46	1,205	-220	1,009
10	Farm Inventory Change	-132	-46	474	-375	-79	-194	-33	605	-443	-65
11	Personal Saving excluding Farm Inventory Change	92	-58	239	232	505	172	79	600	223	1,074
12	Personal Income	2,152	2,414	3,151	2,673	10,390	2,394	2,798	3,858	2,893	11,943
13	Personal Disposable Income ²	1,960	2,116	2,991	2,532	9,599	2,218	2,504	3,686	2,713	11,121

1. Includes net expenditure abroad.

2. Personal Income less Total Personal Direct Taxes.

TABLE 3. Sources of Personal Income, by Quarters, 1947-1952

1949					1950					1951					1952					No.
I	II	III	IV	Year	I	II	III	IV	Year	I	II	III	IV	Year	I	II	III	IV	Year	
(millions of dollars)																				
1,843	1,911	1,996	2,011	7,761	1,915	2,023	2,138	2,235	8,311	2,218	2,376	2,500	2,582	9,676	2,540	2,611	2,752	2,840	10,743	1
-60	-58	-60	-61	-239	-59	-60	-67	-70	-256	-75	-76	-82	-80	-313	-82	-83	-83	-88	-336	2
26	30	30	29	115	32	30	36	39	137	41	48	54	58	201	60	67	69	74	270	3
70	390	967	173	1,600	56	174	1,017	155	1,402	129	376	1,359	278	2,142	153	75	1,377	304	1,909	4
293	351	364	361	1,369	293	364	387	400	1,444	334	384	387	398	1,503	306	392	401	423	1,522	5
281	272	276	328	1,157	294	320	322	359	1,295	324	358	348	390	1,420	376	395	372	397	1,540	6
262	222	223	243	950	304	250	239	240	1,033	297	240	244	249	1,030	381	323	333	333	1,370	7
5	6	6	6	23	4	6	8	7	25	7	7	7	6	27	6	8	8	8	30	8
5	5	5	6	21	5	5	6	7	23	6	6	6	7	25	6	6	6	7	25	9
2,725	3,129	3,807	3,096	12,757	2,844	3,112	4,086	3,372	13,414	3,281	3,719	4,823	3,888	15,711	3,746	3,794	5,235	4,298	17,073	10

TABLE 4. Disposition of Personal Income, by Quarters, 1947-1952

1949					1950					1951					1952					No.
I	II	III	IV	Year	I	II	III	IV	Year	I	II	III	IV	Year	I	II	III	IV	Year	
(millions of dollars)																				
199	259	101	118	677	144	184	137	147	612	180	268	209	234	891	266	332	279	300	1,177	1
10	15	15	15	55	16	16	16	18	66	17	18	15	19	69	21	17	15	18	71	2
19	13	11	14	57	20	15	12	15	62	23	16	13	16	68	25	18	13	16	72	3
228	287	127	147	789	180	215	165	180	740	220	302	237	269	1,028	312	367	307	334	1,320	4
1,435	1,683	1,707	1,974	6,799	1,507	1,759	1,832	2,143	7,241	1,701	1,940	1,999	2,376	8,016	1,856	2,041	2,087	2,485	8,470	5
213	289	267	315	1,084	280	346	349	368	1,343	390	385	295	312	1,382	306	435	368	423	1,532	6
753	780	732	815	3,080	829	867	827	922	3,445	951	977	937	1,034	3,899	1,057	1,099	1,032	1,144	4,332	7
2,401	2,752	2,706	3,104	10,963	2,616	2,972	3,008	3,433	12,029	3,042	3,302	3,231	3,722	13,297	3,219	3,575	3,487	4,053	14,334	8
96	90	974	-155	1,005	48	-75	913	-241	645	19	115	1,355	-103	1,386	215	-148	1,441	-89	1,419	9
-162	-20	474	-364	-72	-142	-20	693	-400	131	-129	-69	1,025	-473	354	-150	-215	1,050	-447	238	10
258	110	500	209	1,077	190	-55	220	159	514	148	184	330	370	1,032	365	67	391	358	1,181	11
2,725	3,129	3,807	3,096	12,757	2,844	3,112	4,086	3,372	13,414	3,281	3,719	4,823	3,888	15,711	3,746	3,794	5,235	4,298	17,073	12
2,497	2,842	3,680	2,949	11,968	2,664	2,897	3,921	3,192	12,674	3,061	3,417	4,586	3,619	14,683	3,434	3,427	4,928	3,964	15,753	13

SECTION 2

QUARTERLY DATA SEASONALLY ADJUSTED AT ANNUAL RATES

TABLE 5. National Income and Gross National Product, by Quarters, 1947-1952, Seasonally Adjusted at Annual Rates

		1947					1948				
		I	II	III	IV	Year	I	II	III	IV	Year
No.		(millions of dollars)									
1	Wages, Salaries and Supplementary Labour Income	5,960	6,092	6,232	6,600	6,221	6,828	7,052	7,252	7,548	7,170
2	Military Pay and Allowances	104	72	80	76	83	76	72	88	92	82
3	Investment Income	2,080	2,332	2,316	2,348	2,269	2,492	2,404	2,424	2,536	2,464
	Net Income of Unincorporated Business:										
4	Accrued Net Income of Farm Operators from Farm Production ¹	1,132	1,228	1,248	1,284	1,223	1,504	1,488	1,460	1,620	1,518
5	Net Income of Non-Farm Unincorporated Business ²	1,124	1,188	1,200	1,244	1,189	1,276	1,324	1,320	1,384	1,326
6	Net National Income at Factor Cost	10,400	10,912	11,076	11,552	10,985	12,176	12,340	12,544	13,180	12,560
7	Indirect Taxes Less Subsidies	1,492	1,580	1,608	1,736	1,604	1,776	1,756	1,772	1,784	1,772
8	Depreciation Allowances and Similar Business Costs	1,020	1,088	1,152	1,212	1,118	1,220	1,260	1,296	1,328	1,276
9	Residual Error of Estimate	120	172	-144	96	61	-4	4	60	-40	5
10	Gross National Product at Market Prices	13,032	13,752	13,692	14,596	13,768	15,168	15,360	15,672	16,252	15,613
11	Gross National Product at Market Prices (excluding accrued net income of farm operators from farm production)	11,900	12,524	12,444	13,312	12,545	13,664	13,872	14,212	14,632	14,095

1. Includes an arbitrary smoothing of crop production, standard seasonal adjustments for livestock items, and no seasonal adjustment for earnings of the Canadian Wheat Board. Because of the arbitrary elements, too precise an interpretation should not be given the seasonally adjusted figures of accrued net income of farm operators.

2. Includes net income of independent professional practitioners.

TABLE 6. Gross National Expenditure, by Quarters, 1947-1952, Seasonally Adjusted at Annual Rates

No.		1947					1948				
		I	II	III	IV	Year	I	II	III	IV	Year
		(millions of dollars)									
1	Personal Expenditure on Consumer Goods and Services	8,808	8,936	9,316	9,632	9,173	9,836	9,912	10,128	10,572	10,112
2	Government Expenditure on Goods and Services ¹	1,656	1,540	1,504	1,580	1,570	1,684	1,744	1,844	1,920	1,798
	Gross Domestic Investment ² :										
3	New Residential Construction	408	504	524	588	506	476	632	704	736	637
4	New Non-Residential Construction	536	596	604	660	599	764	792	832	884	818
5	New Machinery and Equipment	880	988	1,064	1,132	1,016	1,192	1,212	1,196	1,320	1,230
6	Change in Inventories.....	792	1,248	524	1,224	947	664	724	636	396	605
7	<i>Business Inventories only</i> ³	688	1,156	752	1,412	1,002	556	496	736	692	620
8	Exports of Goods and Services	3,536	3,712	3,676	3,628	3,638	3,968	3,856	4,064	4,328	4,054
9	Deduct: Imports of Goods and Services	-3,468	-3,604	-3,660	-3,752	-3,621	-3,420	-3,508	-3,672	-3,944	-3,636
10	Residual Error of Estimate	-116	-168	140	-96	-60	4	-4	-60	40	-5
11	Gross National Expenditure at Market Prices	13,032	13,752	13,692	14,596	13,768	15,168	15,360	15,672	16,252	15,613

1. Includes outlay on new durable assets such as building and highway construction by governments, other than government business enterprises. Also includes the change in inventories of government commodity agencies.

2. Includes capital expenditures by private and government business enterprises, private non-commercial institutions, and outlays by individuals on new residential construction.

3. Excludes change in farm inventories and grain in commercial channels.

TABLE 5. National Income and Gross National Product, by Quarters, 1947-1952, Seasonally Adjusted at Annual Rates

1949					1950					1951					1952					No.
I	II	III	IV	Year	I	II	III	IV	Year	I	II	III	IV	Year	I	II	III	IV	Year	
(millions of dollars)																				
7,668	7,700	7,728	7,948	7,761	7,940	8,160	8,332	8,812	8,311	9,168	9,640	9,736	10,160	9,676	10,492	10,552	10,704	11,224	10,743	1
104	120	120	116	115	128	120	144	156	137	164	192	216	232	201	240	268	276	296	270	2
2,460	2,400	2,396	2,524	2,445	2,632	2,744	3,540	3,704	3,155	3,876	3,860	3,404	3,428	3,642	3,620	3,648	3,612	3,784	3,666	3
1,468	1,448	1,408	1,692	1,504	1,408	1,416	1,548	1,640	1,503	1,892	2,460	2,076	1,996	2,106	1,996	1,708	1,748	2,284	1,934	4
1,384	1,372	1,364	1,356	1,369	1,368	1,440	1,460	1,508	1,444	1,564	1,508	1,444	1,496	1,503	1,428	1,540	1,516	1,604	1,522	5
13,084	13,040	13,016	13,636	13,194	13,476	13,880	15,024	15,820	14,550	16,664	17,660	16,876	17,312	17,128	17,776	17,716	17,856	19,192	18,135	6
1,828	1,792	1,860	1,840	1,830	1,888	1,936	2,076	2,172	2,018	2,452	2,324	2,588	2,508	2,468	2,664	2,612	2,788	2,684	2,687	7
1,380	1,428	1,464	1,476	1,437	1,588	1,644	1,628	1,684	1,636	1,852	1,924	1,864	1,916	1,889	2,032	2,120	2,064	2,064	2,070	8
60	168	-8	-216	1	-4	212	-284	72	-1	-36	-28	52	-128	-35	32	220	228	-4	119	9
16,352	16,428	16,332	16,736	16,462	16,948	17,672	18,444	19,748	18,203	20,932	21,880	21,380	21,608	21,450	22,504	22,668	22,936	23,936	23,011	10
14,884	14,980	14,924	15,044	14,958	15,540	16,256	16,896	18,108	16,700	19,040	19,420	19,304	19,612	19,344	20,508	20,960	21,188	21,652	21,077	11

TABLE 6. Gross National Expenditure, by Quarters, 1947-1952, Seasonally Adjusted at Annual Rates

1949					1950					1951					1952					No.
I	II	III	IV	Year	I	II	III	IV	Year	I	II	III	IV	Year	I	II	III	IV	Year	
(millions of dollars)																				
10,528	11,016	11,024	11,284	10,963	11,440	11,904	12,356	12,416	12,029	13,212	13,352	13,256	13,368	13,297	13,996	14,320	14,312	14,708	14,334	1
1,920	2,124	2,232	2,236	2,128	2,240	2,252	2,348	2,464	2,326	2,688	3,012	3,584	3,564	3,212	3,988	4,040	4,172	4,664	4,216	2
740	740	744	744	742	740	740	844	880	801	868	796	740	720	781	696	748	832	936	803	3
892	896	908	916	903	952	996	1,076	1,080	1,026	1,188	1,244	1,300	1,308	1,260	1,440	1,412	1,508	1,544	1,476	4
1,364	1,316	1,320	1,292	1,323	1,336	1,348	1,452	1,420	1,389	1,680	1,768	1,864	1,764	1,769	1,744	1,912	1,932	1,848	1,859	5
816	380	-8	-264	231	404	680	536	2,220	960	2,176	2,756	1,192	356	1,620	416	16	280	400	278	6
724	260	236	56	319	208	476	508	1,884	769	1,664	2,148	1,100	156	1,267	-260	-320	296	80	-51	7
4,008	4,060	3,900	4,076	4,011	3,896	4,180	4,204	4,452	4,183	4,672	4,844	5,404	5,436	5,089	5,632	5,596	5,488	5,608	5,581	8
-3,856	-3,936	-3,796	-3,760	-3,837	-4,068	-4,216	-4,656	-5,112	-4,513	-5,584	-5,920	-5,912	-5,036	-5,613	-5,376	-5,156	-5,356	-5,780	-5,417	9
-60	-168	8	212	-2	8	-212	284	-72	2	32	28	-48	128	35	-32	-220	-232	8	-119	10
16,352	16,428	16,332	16,736	16,462	16,948	17,672	18,444	19,748	18,203	20,932	21,880	21,380	21,608	21,450	22,504	22,668	22,936	23,936	23,011	11

TABLE 7. Sources of Personal Income, By Quarters, 1947-1952, Seasonally Adjusted at Annual Rates

No.		1947					1948				
		I	II	III	IV	Year	I	II	III	IV	Year
		(millions of dollars)									
1	Wages, Salaries and Supplementary Labour Income	5,960	6,092	6,232	6,600	6,221	6,828	7,052	7,252	7,548	7,170
2	Deduct: Employer and Employee Contributions to Social Insurance and Government Pension Funds	-172	-164	-184	-204	-181	-216	-220	-228	-232	-224
3	Military Pay and Allowances	104	72	80	76	83	76	72	88	92	82
4	Net Income Received by Farm Operators from Farm Production ¹	1,048	1,084	1,188	1,324	1,161	1,352	2,316	1,424	1,416	1,627
5	Net Income of Non-farm Unincorporated Business	1,124	1,188	1,200	1,244	1,189	1,276	1,324	1,320	1,384	1,326
6	Interest, Dividends and Net Rental Income of Persons ²	912	1,068	1,060	1,132	1,043	1,052	1,036	1,080	1,064	1,058
	Transfer Payments to Persons:										
7	From governments (excluding interest)	828	848	836	844	839	860	844	868	880	863
8	Charitable contributions from corporations	16	16	16	20	17	20	20	24	24	22
9	Net bad debt losses of corporations	12	16	20	24	18	16	16	20	24	19
10	Personal Income	9,832	10,220	10,448	11,060	10,390	11,264	12,460	11,848	12,200	11,943

1. This item differs from line 4, Table 5 in that it excludes undistributed earnings (and the inventory valuation adjustment) of the Canadian Wheat Board.
 2. Includes all government debt interest paid to persons.

TABLE 8. Disposition of Personal Income, By Quarters, 1947-1952, Seasonally Adjusted at Annual Rates

No.		1947					1948				
		I	II	III	IV	Year	I	II	III	IV	Year
		(millions of dollars)									
1	Income Taxes	696	696	700	688	695	684	704	752	728	717
2	Succession Duties	60	60	68	56	61	68	64	56	44	58
3	Miscellaneous	32	36	36	36	35	44	44	52	48	47
4	Total Personal Direct Taxes	788	792	804	780	791	796	812	860	820	822
5	Non-durable Goods	5,596	5,592	5,848	6,068	5,776	6,300	6,304	6,520	6,720	6,461
6	Durable Goods	776	836	880	916	852	848	916	888	1,004	914
7	Services ¹	2,436	2,508	2,588	2,648	2,545	2,688	2,692	2,720	2,848	2,737
8	Total Personal Expenditure on Consumer Goods and Services	8,808	8,936	9,316	9,632	9,173	9,836	9,912	10,128	10,572	10,112
9	Personal Saving	236	492	328	648	426	632	1,736	860	808	1,009
10	Farm Inventory Change	28	-24	-148	172	-79	148	220	-520	-108	-65
11	Personal Saving excluding Farm Inventory Change	208	516	476	820	505	484	1,516	1,380	916	1,074
12	Personal Income	9,832	10,220	10,448	11,060	10,390	11,264	12,460	11,848	12,200	11,943
13	Personal Disposable Income ²	9,044	9,428	9,644	10,280	9,599	10,468	11,648	10,988	11,380	11,121

1. Includes net expenditure abroad.
 2. Personal Income less Total Personal Direct Taxes.

TABLE 7. Sources of Personal Income, By Quarters, 1947-1952, Seasonally Adjusted at Annual Rates

1949					1950					1951					1952					No.
I	II	III	IV	Year	I	II	III	IV	Year	I	II	III	IV	Year	I	II	III	IV	Year	
(millions of dollars)																				
7,668	7,700	7,728	7,948	7,761	7,940	8,160	8,332	8,812	8,311	9,168	9,640	9,736	10,160	9,676	10,492	10,552	10,704	11,224	10,743	1
-232	-244	-240	-240	-239	-228	-252	-268	-276	-256	-296	-316	-324	-316	-313	-328	-344	-328	-344	-336	2
104	120	120	116	115	128	120	144	156	137	164	192	216	232	201	240	268	276	296	270	3
1,364	2,240	1,360	1,436	1,600	1,380	1,344	1,336	1,548	1,402	1,876	2,652	1,848	2,192	2,142	2,000	1,568	1,500	2,568	1,909	4
1,384	1,372	1,364	1,356	1,369	1,368	1,440	1,460	1,508	1,444	1,564	1,508	1,444	1,496	1,503	1,428	1,540	1,516	1,604	1,522	5
1,172	1,088	1,148	1,220	1,157	1,224	1,280	1,344	1,332	1,295	1,352	1,432	1,452	1,444	1,420	1,568	1,576	1,548	1,468	1,540	6
896	912	956	1,036	950	1,032	1,048	1,028	1,024	1,033	992	1,032	1,040	1,056	1,030	1,256	1,424	1,392	1,408	1,370	7
20	24	24	24	23	16	24	32	28	25	28	28	28	24	27	24	32	32	32	30	8
20	20	20	24	21	20	20	24	28	23	24	24	24	28	25	24	24	24	28	25	9
12,396	13,232	12,480	12,920	12,757	12,880	13,184	13,432	14,160	13,414	14,872	16,192	15,464	16,316	15,711	16,704	16,640	16,664	18,284	17,073	10

TABLE 8. Disposition of Personal Income, By Quarters, 1947-1952, Seasonally Adjusted at Annual Rates

1949					1950					1951					1952					No.
I	II	III	IV	Year	I	II	III	IV	Year	I	II	III	IV	Year	I	II	III	IV	Year	
(millions of dollars)																				
752	708	656	592	677	560	588	620	680	612	772	848	936	1,008	891	1,084	1,148	1,224	1,252	1,177	1
40	60	60	60	55	64	64	64	72	66	68	72	60	76	69	84	68	60	72	71	2
52	56	60	60	57	56	60	64	68	62	68	64	68	72	68	72	72	72	72	72	3
844	824	776	712	789	680	712	748	820	740	908	984	1,064	1,156	1,028	1,240	1,288	1,356	1,396	1,320	4
6,580	6,880	6,804	6,932	6,799	6,896	7,236	7,428	7,404	7,241	7,768	7,976	8,092	8,228	8,016	8,400	8,412	8,468	8,600	8,470	5
980	1,076	1,108	1,172	1,084	1,272	1,268	1,424	1,408	1,343	1,684	1,536	1,216	1,092	1,382	1,404	1,580	1,520	1,624	1,532	6
2,968	3,060	3,112	3,180	3,080	3,272	3,400	3,504	3,604	3,445	3,760	3,840	3,948	4,048	3,899	4,192	4,328	4,324	4,484	4,332	7
10,528	11,016	11,024	11,284	10,963	11,440	11,904	12,356	12,416	12,029	13,212	13,352	13,256	13,368	13,297	13,996	14,320	14,312	14,708	14,314	8
1,024	1,392	680	924	1,005	760	568	328	924	645	752	1,856	1,144	1,792	1,386	1,468	1,032	996	2,180	1,419	9
36	176	-548	88	-72	184	152	56	132	131	428	404	524	60	354	372	-28	192	416	238	10
988	1,216	1,268	836	1,077	576	416	272	792	514	324	1,452	620	1,732	1,032	1,096	1,060	804	1,764	1,181	11
12,396	13,232	12,480	12,920	12,757	12,880	13,184	13,432	14,160	13,414	14,872	16,192	15,464	16,316	15,711	16,704	16,640	16,664	18,284	17,073	12
11,552	12,408	11,704	12,208	11,968	12,200	12,472	12,684	13,340	12,674	13,964	15,208	14,400	15,160	14,683	15,464	15,352	15,308	16,888	15,753	13

SECTION 3

**QUARTERLY DATA IN CONSTANT (1949) DOLLARS UNADJUSTED
FOR SEASONALITY**

TABLE 9. Gross National Expenditure in Constant (1949) Dollars, By Quarters, 1947-1952, Unadjusted for Seasonality¹

No.		1947					1948				
		I	II	III	IV	Year	I	II	III	IV	Year
		(millions of dollars)									
1	Personal Expenditure on Consumer Goods and Services	2,488	2,662	2,630	2,966	10,746	2,401	2,579	2,532	2,963	10,475
2	(Non-durable Goods)	1,550	1,682	1,729	1,937	6,898	1,475	1,609	1,645	1,904	6,633
3	(Durable Goods).....	216	250	247	284	997	195	233	215	288	931
4	(Services).....	722	730	654	745	2,851	731	737	672	771	2,911
5	Government Expenditure on Goods and Services	552	384	474	485	1,895	485	380	517	527	1,909
	Gross Domestic Investment:										
6	New Residential Construction.....	99	173	170	166	608	85	186	201	188	660
7	New Non-Residential Construction	133	164	199	203	699	168	196	242	241	847
8	New Machinery and Equipment	265	318	303	322	1,208	322	361	292	328	1,303
9	Change in Inventories	-98	-17	701	-175	411	-303	-182	928	-367	76
10	(Business Inventories Only)	172	151	46	130	499	14	-42	65	25	62
11	Exports of Goods and Services	926	1,057	1,125	1,055	4,163	914	1,027	1,132	1,121	4,194
12	Deduct: Imports of Goods and Services	-980	-1,128	-1,044	-1,032	-4,184	-798	-1,015	-938	-997	-3,748
13	Residual Error of Estimate	-5	14	-2	-74	-67	23	-4	3	-25	-3
14	Gross National Expenditure	3,380	3,627	4,556	3,916	15,479	3,297	3,528	4,909	3,979	15,713

1. See footnotes 1 to 3, Table 2.

TABLE 9. Gross National Expenditure in Constant (1949) Dollars, By Quarters, 1947-1952, Unadjusted for Seasonality¹

1949					1950					1951					1952					No.
I	II	III	IV	Year	I	II	III	IV	Year	I	II	III	IV	Year	I	II	III	IV	Year	
(millions of dollars)																				
2,423	2,766	2,701	3,073	10,963	2,588	2,917	2,901	3,239	11,645	2,765	2,909	2,778	3,141	11,593	2,728	3,069	2,983	3,461	12,241	1
1,439	1,695	1,704	1,960	6,798	1,519	1,761	1,796	2,043	7,119	1,561	1,721	1,735	2,017	7,034	1,600	1,801	1,812	2,202	7,445	2
214	288	266	315	1,083	279	344	346	355	1,324	356	331	250	264	1,201	255	371	319	369	1,314	3
770	783	731	798	3,082	790	812	759	841	3,202	848	857	793	860	3,358	873	897	822	890	3,482	4
500	430	602	596	2,128	566	446	598	606	2,216	623	542	792	770	2,727	897	718	906	972	3,493	5
139	206	207	190	742	140	200	218	202	760	143	185	171	151	650	105	167	186	191	649	6
181	214	260	248	903	185	233	288	264	970	210	262	309	280	1,061	226	284	343	311	1,164	7
331	374	313	305	1,323	314	369	323	311	1,317	364	421	365	349	1,499	354	460	385	370	1,569	8
-130	-136	746	-407	73	-137	-56	854	-70	591	14	262	1,292	-568	1,000	-234	-280	1,419	-514	391	9
125	33	42	-45	155	86	100	-44	233	375	215	403	167	-120	665	-22	32	65	-86	-11	10
854	1,020	1,067	1,070	4,011	840	1,014	1,073	1,107	4,034	919	1,057	1,215	1,227	4,418	1,051	1,229	1,266	1,337	4,883	11
-856	-1,095	-953	-933	-3,837	-857	-1,086	-1,056	-1,211	-4,210	-1,077	-1,279	-1,235	-1,110	-4,701	-1,044	-1,246	-1,256	-1,361	-4,907	12
7	9	-33	15	-2	1	-13	78	-64	2	-5	39	14	-17	31	-13	-17	-17	-53	-100	13
3,449	3,788	4,910	4,157	16,304	3,640	4,024	5,277	4,384	17,325	3,956	4,398	5,701	4,223	18,278	4,070	4,384	6,215	4,714	19,383	14

PART II

CONCEPTS, SOURCES AND METHODS

SECTION I

REVIEW OF SOURCES AND METHODS, AND SUMMARY OF CONCEPTUAL FRAMEWORK

This section provides a general review of the statistical sources upon which the quarterly National Accounts estimates are based, together with a description of the procedures used in making the required estimates. It is designed to give the users of the data a general view of the content of the various aggregates and background for appraising the reliability of the statistical results. The section is introduced by a note on concepts and definitions,

and a discussion of problems peculiar to estimates of Gross National Product and Expenditure and Personal Income and Expenditure on a quarterly basis. A table is included at the end of the section which summarizes in a schematic way the statistician's view of the qualitative precision of the various components of Gross National Product and Expenditure.

CONCEPTS AND DEFINITIONS

Except for the time interval involved, the objectives of both the quarterly and annual estimates of Gross National Product and Expenditure are identical — that is to measure the value of goods and services produced by Canadian residents in a given period (a quarter or year) and to portray the inter-related structure of transactions generated by productive activity. Similarly, the objectives of both the quarterly and annual estimates of Personal Income and Expenditure are identical — to measure all current receipts of income, in cash or in kind, by persons (including individuals, private non-commercial institutions and pension funds), and to show the disposition of this income by major categories. Thus, the broad conceptual framework which underlies the quarterly estimates is the same as that upon which the annual estimates are based. This conceptual system is described in Part II of "National Accounts, Income and Expenditure 1926-1950", and will not be further elaborated here. However, for convenience, a brief description of the main aggregates is given below.

Gross National Product

An overall measure of our economic achievements is provided by the Gross National Product. This aggregate measures the value of goods and services produced by Canadian residents in a given period by adding together all costs arising in production. For the economy as a whole, these costs consist first of factor costs, that is to say, the earnings of the factors of production employed: wages and salaries, investment income including corporation profits before taxes, and net income of unincorporated business. The sum of these factor costs is the National Income. To arrive at the total which measures production at market prices it is necessary to add elements of market prices which do not represent incomes of factors of production, that is, depreciation allowances and similar business costs, and indirect

taxes less subsidies. The total thus obtained is called the Gross National Product.

Gross National Expenditure

The market value of goods and services produced by Canadian residents in a given period can also be measured by adding together all final sales made during the period, adjusted for changes in inventories and imports; for what is produced must be disposed of, either by sales or addition to inventories. The aggregate arrived at in this manner is called Gross National Expenditure. It is made up of four main components: sales to consumers (personal expenditure on consumer goods and services); sales to governments (government expenditure on goods and services); sales to business on capital account (gross domestic investment in new construction, machinery and equipment, and inventories); and sales to non-residents (exports of goods and services). Since the total of sales thus enumerated includes the value of imported goods and services and since it is desired to measure production of Canadian residents only, imports of goods and services are deducted from the grand total of sales.

Personal Income

Personal Income is a measure of all current receipts of income, in cash or in kind, of persons (including individuals, private non-commercial institutions and private pension funds). It differs from National Income in that it excludes all earnings not paid out to persons, such as undistributed corporation profits and profits of government business enterprises, and includes receipts which have not been earned in the course of current production, that is, transfer payments. The whole of net income of unincorporated business is included¹, since it is not

1. Except for the allowance which is made for the adjustment on grain transactions (see p. 52).

statistically possible to separate withdrawals for personal use from earnings retained in the business.

Personal Expenditure

The other side of the Personal Income and Expenditure Account shows the disposition of Personal Income by three main categories: personal

direct taxes, (i.e. personal income taxes, succession duties, and miscellaneous licenses and fees), personal purchases of goods and services; and personal saving. The latter category is estimated residually, and includes, in addition to cash savings, purchases of bonds, the savings portion of life insurance premiums, repayment of debt including residential mortgages, and net new investment in plant, equipment and inventories by individual enterprisers including farmers.

PROBLEMS RELATING TO THE CONCEPT OF QUARTERLY ESTIMATES

Although the concepts and definitions which underly the annual estimates are theoretically consistent with the requirements of the quarterly estimates, a number of special problems of application arise when an attempt is made to convert this conceptual system to a quarterly basis. It will be appropriate at this point to comment briefly on some of these problems.

(a) The Accrual Principle

Quarterly estimates of Gross National Product and Expenditure aim primarily at measuring the value of production in specific quarters. As indicated above, this aim can be achieved in two ways — by summing the costs involved in production, on the one hand (G.N.P.), and by tracing the disposition of this production through sales adjusted for imports and changes in inventories, on the other hand (G.N.E.). On the Gross National Product side of the Account, it is theoretically desirable to include expenses on an accrual basis in order to relate factor and other costs to the quarter in which the economic activity occurred. For example, bond interest which is normally paid only once or twice a year, accrues continuously throughout the year, and is, therefore, chargeable to the production of all four quarters. Similarly, retroactive wage payments should, theoretically, be allocated back to the quarter to which they refer, since the services rendered relate to past periods.

In practice, however, the factor and other costs included in Gross National Product are drawn from a variety of different sources which are, in many cases, independent of each other in an accounting sense. For example, quarterly corporation profits (and in some cases, net incomes of unincorporated businesses) reflect prevailing practices in industry with respect to the treatment of business expenses (mainly accrual), while the bulk of wages and salaries, and indirect taxes, are reported to the Bureau on a cash basis. It will therefore be seen that there is necessarily a mixture of both cash and accrual elements in the quarterly estimates of Gross National Product. In general, the principle of computing expenses on an accrual basis has been adhered to wherever the data permit it to be done. Even within these limits, however, consistency with other series has had to be an over-riding consideration.

From the foregoing it will be clear that failure to apply the accrual principle uniformly throughout the estimates of Gross National Product stems mainly from the manner in which data are reported to the Dominion Bureau of Statistics. However, comparability in the estimates from quarter to quarter need not be affected, even though a degree of unbalance between the Gross National Product and Gross National Expenditure may exist within each quarter because individual series are not mutually consistent in an accounting sense. This unbalance is reflected, together with other errors and omissions, in the item called "residual error of estimate". It will be noted that the latter is small relative to the magnitude of the aggregates included in the tables.

It may be noted that to some extent the problem of the "accrual" versus the "cash" basis of calculation applies to annual estimates as well. However, since the year rather than the quarter is regarded as the standard unit of time for production and accounting purposes, cash payments and accrued expenses coincide to a very large extent over the full year.

In contrast to the Gross National Product which is linked to the accrual principle through the "measurement of production" approach, Personal Income is defined in terms of "receipts" of income. Thus, in general, the quarterly components of Personal Income are shown on a "receipts" basis except in the case of certain elements of interest and net rental income of persons where the statistical information permits only an accrual method of calculation. In the case of net income of unincorporated business, it is not possible to separate withdrawals for personal use from earnings retained in the business. This latter problem is not unique to the quarterly estimates, however, but also occurs in the annual calculations.

(b) Quarterly Farm Inventories¹

The measurement of farm inventories (and thus of net income of farm operators from farm production) on a quarterly basis presents a difficult theoretical problem which is closely related to the accrual principle discussed above. Farm production has marked

1. For method of estimation, see page 52.

seasonal characteristics associated particularly with plant growth, and in such cases it is difficult to assess the production represented by growing inventories not yet in market form. Thus, the harvesting of a grain crop in the fall of the year represents the culmination of the productive activity of previous periods, and in a theoretical sense the value of this production might be "accrued" throughout the ploughing, seeding and growing periods. As a practical matter, however, it is impossible to assess the value of growing inventories in this way; such a procedure would entail a forecast of the farm price value of the harvested crop, thus implying a knowledge of future climatic conditions and prices, which cannot be foreseen.

In the case of "goods in process" in manufacturing, we can obtain a reliable measure of production by evaluating "inputs"; thus in the broadest sense, non-farm inventories of "goods in process" appearing in Gross National Expenditure are evaluated at cost, being matched on the Gross National Product side of the accounts by factor shares and other costs. Theoretically, it would be desirable to carry over this procedure to the treatment of agricultural inventories. A considerable part of agricultural activity takes place in the first half of the year, and it should be the objective to measure the value of "inputs", or factor shares and other costs generated in these periods. This approach does not imply any attempt to place a value on crops growing in the field, but is simply a recognition of the fact that unless inventories are measured on an "input" basis, Gross National Product is understated in the

first half of the year by the amount of factor and other costs chargeable to the production of this period, and overstated in the third (harvest) quarter by an equivalent amount. Thus, to take account of grain inventories only in the third (harvest) quarter could conceivably result in farm net income showing losses in the early part of the year, with net income in the third quarter greater than for the year as a whole. On the other hand, the "input" method would eliminate such losses in the early part of the year, and reduce the amount of net income in the third quarter by whatever expenses are incurred in the early part of the year.

At the present time, statistics are not available which will permit the quarterly allocation of farm expenses to grain inventories on an "input" basis, and as a consequence grain inventories have to be counted as production only when they reach marketable form, that is, after harvesting. Consequently, the level of Gross National Product in the first half of the year does not vary according to the intensity of crop-production activity; the value of production generated by such activity is offset by the expenses charged against gross farm income, there being no counter-balancing increase in grain inventories. In the third quarter, however, accrued net farm income (and thus Gross National Product) is overstated to the extent that the expenses incurred earlier in the year are not charged against the harvested crop at this particular point of time. The method of estimating changes in grain and livestock inventories are described on page 62.

SOURCES AND METHODS

The following outline of sources and methods gives a brief summary of the content of each component and describes the procedures employed in

making the required estimates. The section is designed to permit users of the data to appraise in a general way the reliability of the statistical results.

GROSS NATIONAL PRODUCT AT MARKET PRICES

1. Wages, Salaries and Supplementary Labour Income

The estimates of wages, salaries and supplementary labour income are prepared by the Labour and Prices Division of the Dominion Bureau of Statistics. These estimates are designed to include all compensation to Canadian wage earners and salaried employees, including income in kind such as board and lodging¹. They do not include the earnings of self-

employed individuals or partners, the income of independent professionals, the net income of farmers, or payments to members of the armed services. Wages and salaries are estimated on a "gross" basis—that is, they are reckoned before tax deductions, contributions of employees to unemployment insurance, pensions and other social security schemes. Retroactive wage increases are included in the quarter in which they are paid.

1. It may be noted that income in kind consumed by farm proprietors is included with accrued net income of farm operators from farm production, while food and clothing supplied to the armed forces is included with military pay and allowances.

Supplementary labour income consists of other expenditures by employers on labour account that can be regarded as payment for employees' services. Included here are employers' contributions to

pension and employee welfare funds, the unemployment insurance fund, and workmen's compensation funds.¹

The general method of estimation consists in calculating the payments made on labour account by the various industrial groups, and summing the results. This is done by the Labour and Prices Division for each month of the calendar year; quarterly estimates are derived by summing the three relevant months. It should be noted that while the sum of the four quarterly estimates provides a preliminary estimate of wages and salaries paid in the calendar year, this sum may not agree with the final annual total arrived at from Census of Industry and other data. As a result, all quarterly figures which relate to a year for which final annual data are available have been adjusted in retrospect to agree with the annual figure. This is accomplished by applying the quarterly distribution to the annual total.

The greater part of the current monthly labour income estimate is based on a projection technique using payroll indexes in the leading industries. For the most part, these payroll indexes are prepared in the Employment Section of the Labour and Prices Division. In areas where there is no payroll coverage as in the case of agriculture and some of the service groups, the problem of estimation is more difficult and greater reliance must be placed on projection from directly related information. In a number of cases, estimates have had to be based on indirect evidence, but such instances are few and in the aggregate, quite small.

(a) Industries Covered by Payroll Indexes

As pointed out above, the greater part of the monthly wage and salary estimate is based on projection from benchmark data, using monthly payroll indexes in leading industries. These monthly indexes are related to the last pay period of every month and cover establishments normally employing fifteen or more persons. The method used is to multiply wages and salaries in the relevant month of the latest benchmark year by the ratio of the monthly payroll index, current year, to the monthly index, benchmark year. Thus, the month of January 1953 would be calculated as follows: (Payroll index in relevant industry, January 1953 ÷ Payroll index in relevant industry, January 1952) times (Wages and salaries paid in relevant industry, January 1952).

The above method of estimation applies to **manufacturing, forestry, mining, public utilities, transportation, communication, storage, trade, personal service, finance, insurance, real estate, and federal and provincial government.** In the case of the federal and provincial government, fairly complete returns of wages and salaries paid are received in the Public Finance and Transportation Division of

the Dominion Bureau of Statistics, and these are used to construct an index for projection purposes. Income in kind in forestry is allocated on the basis of wages and salaries paid in forestry, computed as above.

Wages and salaries in **construction** are calculated in two parts. The non-residential component employs the use of the payroll index in construction, adjusted to exclude the earnings of government and utility employees engaged in construction activity. The residential component is computed on the basis of a special composite index which takes account of hourly wage rates in the construction trades and the volume of housing put in place.

It should be noted that in a number of the above groups, the payroll index relating to the last pay period in December is consistently low as a result of time taken without pay. The index cannot therefore be taken as representative of this particular month. Accordingly, December indexes for mining, manufacturing, and non-residential construction are adjusted upwards on the basis of aggregate "man-hours worked" data.

(b) Industries Estimated on the Basis of Related Data

Wages and salaries in **agriculture** are computed by projecting the figure in the relevant month of the benchmark year on the basis of the ratio of the product of numbers of paid workers in agriculture (from the labour force survey) and the farm wage-rate index² in the current year, to the product of these two factors in the benchmark year. Estimates of board and lodging received by employees in agriculture are similarly computed, using numbers of paid workers in agriculture and the index of farm family living costs. Monthly wage and salary figures for **business service, education, health, religion, and other community service** are derived using numbers of paid workers as obtained from the labour force survey, and average weekly earnings in finance, insurance, and real estate. **Recreation service** is extrapolated on the product of the number of paid workers in recreation service and average weekly earnings for all service industries. Similar techniques are employed to compute the value of income in kind received by employees of **hospitals and religious institutions** and in **domestic service.**

(c) Estimates Based on Indirect Evidence

Total wages and salaries paid in the **fishing** industry are extrapolated on the monthly value of fish caught and landed.

In **hunting and trapping**, the annual figure is arbitrarily divided into six equal parts covering the coldest months of the year.

1. That portion of employers' contributions to workmen's compensation funds which is estimated to be for medical aid and hospitalization is not regarded as a form of employee income and is therefore excluded.

2. This index is based on a survey made only three times each year. Inter-survey period indexes are derived by interpolation or extrapolation.

Wages and salaries paid by **municipal governments** are projected on the basis of the movement of provincial wages and salaries, determined as described in (a) above.

(d) Supplementary Labour Income

Employers' contributions to pension and welfare funds on behalf of employees are carried forward on the basis of wages and salaries paid in the relevant industries. It should be noted that pensions paid by employers who had no funds set aside for that particular purpose and to which employees do not contribute are also included as supplementary labour income. Payments under government social security schemes to which no contributions are made by employers or employees are regarded as transfer payments and excluded here.

Employers' contributions to unemployment insurance are based on monthly data supplied by the Unemployment Insurance Commission. Employer contributions to workmen's compensation funds are carried forward according to the trend of total wages and salaries, excluding agriculture and personal service.

2. Military Pay and Allowances

Payments to members of the armed forces in Canada and overseas are treated as compensation for services rendered. Under this heading are included military pay of rank and trades pay, marriage, separation, and subsistence allowances, clothing allowances, and the rehabilitation and civilian clothing grants payable to members of the Special Forces on discharge. War service gratuities and all post discharge re-establishment benefits are excluded as transfer payments. The estimated value of food and clothing issues "in kind" is included.

Cash pay and allowances to the armed forces are available on a monthly basis from the Department of National Defence. Income in kind is calculated on the basis of quarterly statements of strengths of the three armed services, and estimated man-day costs for food and clothing.

3. Investment Income

Investment income represents the return on invested capital (including land) owned by Canadian residents¹. It consists primarily of corporation profits, interest, net rents, and profits of government business enterprises. The sum of these items represents the earnings of "capital" in the same way that wages and salaries and military pay and allowances represent the earnings of "labour". As with labour income, the estimates are taken before deduction of direct taxes and include earnings of Canadian factors only, irrespective of geographical location.

1. Capital gains and losses are excluded.

(a) Corporation Profits Before Taxes

The general procedure followed in estimating quarterly corporation profits before taxes is similar to that employed for the annual National Accounts estimates. The concept of "profits before tax" used in the National Accounts differs somewhat from the one employed by the Department of National Revenue for taxation purposes. Depletion charges, which are deductible for income tax purposes, must be added to bring the figures into line with National Accounts definitions; since discoveries of natural resources are not capitalized and are therefore not counted as part of domestic investment and profits, the exhaustion of natural resources should not be regarded as a charge against the National Income. Charitable contributions made by corporations, also deductible as an expense under income tax regulations, are added on the grounds that they are not a direct cost of production, but merely a distribution of earnings. Theoretically, profits relating to foreign owned assets in Canada might be deducted, since they do not represent earnings of Canadian factors of production. In practice, it has been found impossible to separate profits as between non-Canadian and Canadian share-holders, so that only dividends paid to non-residents out of these profits are deducted.

For the years 1950-1952, the basic annual data on profits, depletion charges and charitable contributions are obtained from the Department of National Revenue. The profits figures are adjusted to a calendar year basis; depletion charges are similarly adjusted and, in addition are corrected for under-coverage. The total of the three items is then distributed according to the quarterly movement of the corresponding series as shown by the special quarterly corporation profits survey. A note on this survey will be found in Part II, Section 3, of the present publication. Dividends paid abroad in each quarter, which are deducted, are supplied by the Balance of Payments Section of DBS.

For the current year for which no annual data as yet exist, corporation profits as described above are estimated by projecting forward the figure relating to the relevant quarter in the preceding year in accordance with the change shown by the quarterly corporation profits sample.

For the years 1947 to 1949, synthetic operating accounts were constructed for the major industries. Sales, production, shipments, inventories and price indicators were employed to obtain estimates of quarterly gross value of production. Expenses such as wages and salaries and depreciation were then deducted from these production estimates and the resulting indicators were used to interpolate annual profits data. For industries for which this procedure could not be followed, indicators such as production indexes were used as interpolators. The resultant quarterly estimates are quite approximate and do not possess the same degree of accuracy as the estimates for 1950-1952 which are based on the quarterly corporation profits survey.

(b) Interest and Net Rental Income of Persons

This component is made up of the following items:

- (i) Canadian bond, mortgage and deposit interest received by or accruing to persons.
- (ii) Net rents received by or accruing to persons.
- (iii) Interest and dividends received by persons from non-residents.
- (iv) Miscellaneous investment income.

It should be noted that this section includes all interest and net rents received by or accruing on behalf of persons (defined to include individuals, non-commercial institutions, estates, and trust funds); investment income of life insurance companies accruing on behalf of Canadian policy-holders, together with small amounts of miscellaneous income, are also included under the present heading. On the other hand, interest and net rents paid to corporations and government business enterprises are automatically included in the profits of these institutions and are not counted here. Similarly, income in these categories accruing on owner-used capital, e.g. occupied premises of businesses, is implicitly included in the figures of profits and net income; interest paid to government, other than government enterprises, is included under the next heading, "Government Investment Income".

(i) Canadian Bond, Mortgage and Deposit Interest

Bond interest received by persons is divided into two parts:

- (a) Interest on federal government direct debt; and
- (b) Interest on all other debt.

The annual estimate of bond interest on the federal direct debt received by persons is distributed by quarters on the basis of quarterly payments of total interest on the federal direct debt obtained from the Comptroller of the Treasury. The latter figure is also employed as a projector to carry forward the quarterly estimates from the preceding year to current quarterly periods where no annual data are yet available.

The annual estimate of other bond interest is distributed by quarters on the basis of an index of total interest paid excluding direct federal government debt interest. The projecting index is made up of interest on provincial and municipal direct and guaranteed debt, federal guaranteed debt, Canadian National Railway non-guaranteed debt and funded corporation debt less total interest paid to non-residents. A variety of sources is used in constructing this index; provincial direct debt interest is allocated according to the pattern of interest payments for eight of the ten provinces in the year 1951 (the first year for which this information became available), while municipal direct debt interest is allocated according to the estimated distribution by quarters of bonds and Treasury bills outstanding; provincial and municipal indirect debt is allocated equally among the four quarters. Quarterly estimates of corporate debt outstanding (to which a rate of interest is applied), Canadian Railway non-guaranteed debt interest, and federal guaranteed debt

interest are provided by the Bank of Canada. Quarterly interest paid to non-residents is estimated by the Balance of Payments Section of DBS.

The figure of mortgage interest accruing to persons (including interest on agreements of sale) is among the least satisfactory in investment income. For years in which annual data are available, the quarterly estimates are derived by straight line interpolation between the annual totals. For the current year, the annual interest is forecast and the same method is used to arrive at quarterly figures.

The estimates of deposit interest received by persons are derived, for the years for which annual data are available, by allocating the annual totals according to the level of monthly total notice deposits as shown in the Statistical Summary of the Bank of Canada. For the current period, where no annual data exist, the ratio of year to year changes in the quarterly level of notice deposits is used to carry forward the previous year's quarterly benchmark figures.

(ii) Net Rents Received by Persons

For convenience in making the estimates, the rental field is divided into three main parts:

- (a) residential non-farm rents, (b) non-residential non-farm rents, and (c) residential and non-residential farm rents. Of these three classes, the first is the most important in size. It is also the one for which statistical coverage is most satisfactory.

The method used for each class is similar: total gross rents are first estimated; amounts received by business corporations and governments are then subtracted to arrive at gross rents received by persons. Expenses are deducted from this remainder to obtain net rents received by persons. The sum of net rents received by persons for the three sectors gives the required total.

Gross residential non-farm rents are estimated by multiplying the number of urban and rural non-farm dwellings by an estimate of the average rent per dwelling. For purposes of this calculation, dwellings are divided into owned and rented, and by location into urban and rural non-farm areas. The basic number of dwellings is available annually from the Central Mortgage and Housing Corporation, and quarterly additions are obtained from the monthly housing bulletin published by DBS. An allowance is made annually for dwellings demolished, for new dwellings created by conversions, or for dwellings which changed from the tenant to owner-occupied status or vice versa, but quarterly data is not available. Monthly average rent figures are compiled by the Special Surveys Division of DBS, and imputed rents on owner-occupied dwellings are projected on the same quarterly trend as paid rents. From the gross rent figures as estimated above, amounts received by government are subtracted. The latter figure is allocated by quarters by dividing the annual figure by four; for the current year for which no annual data are available the same figures are used

as in the previous year. Residential rents received by corporations should also be subtracted, but no data are available which permit this to be done.

The items of expense which are subtracted from gross rents to arrive at net residential non-farm rents received by persons are: heating costs included in paid rents, taxes, depreciation, mortgage interest, repairs, and fire insurance. Heating costs are allocated or projected on the movement of the sales of wood and coal dealers. Taxes are allocated equally among the four quarters and carried forward on the current year on a forecast basis. Depreciation is taken as 20 per cent of gross rural non-farm rents and 15 per cent of gross urban rents. Mortgage interest and fire insurance premiums are projected on a straight line trend, between annual benchmarks; for the current period, it is necessary to forecast the annual figure. Repair and maintenance expenditures are allocated according to the estimated distribution of total housing stocks by quarters, with an adjustment to take account of wages and material prices.

Non-residential non-farm rents¹ received by persons are estimated by straight line interpolation.

The third class of rents—**residential and non-residential farm**—are estimated as follows: annual estimates for each group are prepared in the Agriculture Division of DBS. Paid and imputed residential farm rents, which are fairly stable, are allocated by straight line projection between annual benchmarks. Non-residential farm rents are divided into two groups—those which are paid on a pre-determined cash basis and those which are paid on a share-crop basis. The former are again allocated by straight line interpolation, while the latter are distributed according to the movement of sales of field crops.

(iii) Interest and Dividends Received by Persons from Non-Residents

Quarterly estimates of interest and dividends received by persons from non-residents are supplied by the Balance of Payments Section of the Bureau.

(iv) Miscellaneous Investment Income

In addition to investment income received by life insurance companies on behalf of Canadian policyholders, this component includes several miscellaneous categories of income. These are: investment income of fraternal and mutual benefit societies, which like life insurance companies, are treated as associations of individuals; interest on private industrial pension funds and federal government annuities account; and profits of co-operatives and of mutual non-life insurance companies.

With the exception of the last item, the investment income of the above group is divided into two parts—federal and provincial bond interest, and

other. The federal and provincial bond interest is projected by quarters on the basis of total payments of government direct debt interest. Investment income arising from other sources is interpolated on a straight line basis. Profits of co-operatives and mutual non-life insurance companies are simply divided by four.

(c) Government Investment Income

This item includes profits of government business enterprises, and interest on government loans and advances, and on public funds.

Profits of government business enterprises consist of profits (less losses) of those government agencies which conduct their activities on an essentially commercial basis, setting a price for their services which is calculated to cover costs. Included here are profits of the Canadian National Railways, provincial liquor control boards, and provincial and municipal public utilities such as hydro-electric systems, telephone systems, street railways, and so on. The federal Post Office Department is included here, its gross expenditures being offset against its gross revenues to arrive at an estimate of profits.²

At the federal level, current quarterly data are available only with respect to the profits (or losses) of the Canadian National Railways and the Post Office Department. This information is obtained directly from the federal Department of Finance. All other quarterly profits of federal government business enterprises are necessarily estimates based on the level of the previous year's annual figure, and allocated equally to the four quarters of the current year. The figures are adjusted retrospectively when firm annual figures for the current year become available.

At the provincial level, profits of liquor commissions are distributed in accordance with quarterly provincial sales of liquor, wine and beer. Profits of hydro-electric commissions are allocated in accordance with average consumption of electric power. Profits of provincial telephone and railway companies and other miscellaneous enterprises are allocated equally among the four quarters of the year. In all of the above cases, current period estimates are based on the distribution of a forecast annual figure, based on budget estimates and other data.

At the municipal level, all profits of public utilities are distributed by straight line interpolation between annual figures. Again, for current quarters, this procedure involves a forecast of the current annual figure.

Interest on government loans and advances includes interest on loans to government agencies such as the Foreign Exchange Control Board and various public utilities, and interest on loans to foreign and domestic governments. The quarterly figures are

1. Only rents paid are included here. Imputed rents of owner-occupied premises used by business are implicitly included in the estimates of profits and net income.

2. This treatment is approximate only since no allowance has been made for depreciation on postal property.

derived by straight line interpolation between annual data, involving a forecast annual for the current period. **Interest on government pension and social insurance funds** includes interest on pension and superannuation funds, the unemployment insurance fund, and provincial workmen's compensation funds. Since these funds are mainly invested in the government's own bonds, the interest is distributed quarterly according to the movement of gross debt interest. Again, for current quarters, this procedure involves a forecast of the annual total for the current year.

(d) Adjustments

The categories of investment income enumerated thus far include the "transfer" portion of interest on the public debt and a small amount of interest on consumer debt. These elements of income must be excluded, by definition, from the National Income (see National Accounts, Income and Expenditure, 1926-1950, page 87). Further, the estimates of dividends and interest paid to non-residents, which have been explicitly excluded from the totals, include a portion retained by the federal government in the form of "withholding taxes"; it is therefore necessary to add these amounts back. Finally, an inventory valuation adjustment needs to be made to the figures of corporation profits from private grain dealing.

The "transfer" portion of interest on the public debt is deducted in the following manner. First, interest on the "productive" portion of the public debt is added to the total of the items listed above; the annual figure is distributed equally over the four quarters of the year to take account of the fact that services rendered by government productive assets accrue on a day to day basis. For current quarters, this involves a forecast of the annual. Total gross interest payments on the public debt are then deducted. The federal content of this item is available on a quarterly basis from the Comptroller of the Treasury. The provincial content is distributed quarterly according to the pattern of interest payments for eight of the ten provinces in the years 1951 and 1952, while the municipal content is distributed on the basis of a study of bonds and Treasury bills outstanding. Again, for current quarters, a forecast of the annual is involved.

Interest on consumer debt is calculated by applying a rate of interest to the estimated volume of consumer credit outstanding at the end of each quarter which is obtained from the Merchandising and Services Division of DBS and the Bank of Canada.

Quarterly **withholding tax collections** on interest and dividends paid to non-residents are obtained from the Comptroller of the Treasury.

The remaining adjustment is called "**inventory valuation adjustment**". Since Gross National Product is defined to measure the production of new goods and services at current market prices, it is consequently desirable, in valuing inventory changes on the expenditure side of the accounts, to use the

current value of the physical change rather than the change in the reported book values. This means that an "inventory valuation adjustment" must be made to the income side of the accounts, since corporation profits and net income of unincorporated business are usually computed on the basis of changes in book values of inventories.

At the present time, this adjustment is made only for grain in commercial channels; part of the adjustment applying to inventories of the Canadian Wheat Board is included with "accrued net income of farm operators from farm production", but the remainder applies to corporation profits and is included in investment income. The exact manner of making these calculations will be discussed below in the section "Change in Inventories".

4. Net Income of Unincorporated Business

Net income of unincorporated business consists of the accrued net income of farm operators from farm production together with the earnings of other working proprietors from their own businesses. These earnings are accounted for separately in the National Income since they represent a mixture of labour income and investment income which cannot be segregated on anything but an arbitrary basis.

The estimates themselves can be grouped under three broad headings: (a) accrued net income of farm operators from farm production; (b) net professional income; and (c) other unincorporated non-farm income.

(a) Accrued Net Income of Farm Operators from Farm Production

The quarterly estimates of accrued net income of farm operators from farm production are computed in the same way as the annual estimates, that is by constructing a synthetic operating account for the agriculture industry. The procedure is summarized briefly below: farm cash income from the sale of farm products is available on a quarterly basis from the Agriculture Division of DBS. Quarterly estimates are made of the value, at farm prices, of food and forest products grown and consumed on farms, and these, together with imputed gross rents on owner-occupied farm dwellings, constitute the value of "income in kind" received by farmers. The value of the physical change in inventories of grain and livestock held on farms is computed at prevailing quarterly prices. The sum of all these items constitutes gross farm income.

Farm operating expenses are then deducted from this figure. These include taxes on real estate, gross rents on farm land, labour costs, interest on farm debt, feed and seed, binder twine, repairs and depreciation, operating costs of farm machinery, fertilizer and so on. The resultant figure, after deduction of these expenses, corresponds closely to the annual concept of "net income of farm operators from farming operations".

For National Accounts purposes, certain adjustments are made to this figure. Firstly, imputed rents on owner-occupied farm dwellings and profits of agricultural enterprises organized as corporations, are deducted, since these are included in investment income. Secondly, an "adjustment on grain transactions" is made in two parts. The first part takes account of the undistributed earnings of the Canadian Wheat Board¹. This procedure results in a figure of earnings of farm operators arising from current farm production, which is the appropriate aggregate to include in Gross National Product. The second part of the adjustment allows for the fact that the earnings of the Canadian Wheat Board are calculated on the basis of change in book values of inventories, whereas the required valuation of inventories for the National Accounts is the value of physical change (see "Investment Income" above).

To obtain the quarterly distribution of certain of the above items, a number of special procedures have had to be adopted. Farm cash income is, as noted above, available quarterly from the Agriculture Division of DBS. Estimates are made for each of the items of "income in kind" consumed on farms, and these are then summed to obtain a total quarterly figure; when necessary the four quarters are adjusted to bring them intoline with the final annual estimate. Specifically, the value of dairy products consumed on farms in each quarter is calculated from monthly price and quantity data supplied by the Agriculture Division of DBS. Estimates of the quantity and value of poultry consumed on farms are available only on an annual basis. Consumption of hens and chickens is allocated throughout the year, while other types of poultry consumed are assigned arbitrarily to the fourth quarter. For current quarters where no annual data are available, the estimates are based on a forecast annual figure. The value of eggs consumed on farms is published monthly by the Agriculture Division. Estimates of the value of cattle, calves, sheep, lambs and hogs killed and eaten on farms are computed from number and price data. Numbers are available for each six-month period from the semi-annual livestock surveys of the Agriculture Division, and these are arbitrarily allocated to the periods in which farm slaughterings normally occur, that is, the first and fourth quarters; for current periods a forecast is made until the livestock survey is available. Current prices per head of livestock are obtained by projecting the average price per head according to the 1941 Census, on an index of cwt. prices.

The annual estimate of fruits and vegetables consumed in kind are distributed quarterly according to production patterns for each area worked out by the Agriculture Division. For current periods, this method involves a forecast of the annual figure. The value of forest products consumed on the farm is assigned to the months of October to April, inclusive.

Quarterly changes in farm inventories are calculated as follows: the Agriculture Division of DBS prepares estimates of stocks of grain held on farms at the end of each quarterly period. The quarterly quantum change in these stocks is then valued at the average farm price prevailing during the quarter. Similarly, estimates of the number of head of live-stock on farms, by type and age groups, are prepared at quarterly intervals by the Agriculture Division. The quarterly quantum changes in the case of live-stock are valued at farm prices prevailing at the end of each quarter.

Quarterly estimates of farm operating expenses are obtained for past periods by allocating the annual estimate, and for current periods by allocating a forecast annual estimate. The method of allocation differs for most of the expense items. Taxes on real estate and gross rents on farm lands are allocated equally to the four quarters of the year. Farm labour costs are estimated monthly by the Labour and Prices Division of the Bureau and they are identical with the figure included in the wage and salary component of National Income. Interest on farm debt is computed by straight line interpolation between annual benchmarks. The bulk of feed and seed expense is allocated to the first and fourth quarters of the year, since grain fed to livestock is heaviest during the winter period.

Machinery repair is allocated equally to the first three quarters of the year, while building repair is determined by straight line interpolation between annual estimates. Depreciation is also determined by straight line interpolation. The bulk of tractor fuel expense is allocated to the second and third quarters. Truck expenses of petrol, oil and lubricants are distributed according to retail sales of garages and filling stations in the Prairie provinces. Insurance is projected on a straight line, while registration and licence fees are allocated to the first and fourth quarters. Estimates of fertilizer are allocated evenly over the first three quarters of the year.

With regard to the adjustments previously noted, imputed rents on owner-occupied farm dwellings and profits of agricultural enterprises organized as corporations are based on data prepared in connection with the estimates of investment income described above. Payments from the government under the Prairie Farm Assistance Act are obtained from the Agriculture Division of DBS.

The adjustment on grain transactions is discussed below in the section "Change in Business Inventories" (see also Investment Income above).

(b) Net Professional Income

This group includes independent professional practitioners such as doctors, dentists, nurses, lawyers and engineers. In general, there is little quarterly data available on professional incomes. Quarterly net incomes are therefore apportioned on the basis of a straight line trend between annual benchmarks; current quarterly figures are derived on the basis of a forecast of the annual.

1. Data obtained from weekly reports on Canadian Grain Statistics.

(c) Other Unincorporated Non-farm Income

The non-farm group of other unincorporated business covers a heterogeneous range of industries. Again, little systematic information on quarterly net incomes is available for this group. Various methods of estimation are employed to construct the net income series for these industries, including the synthetic operating account method, the "ratio of net to gross income" method, and allocation or projection on the basis of indexes. In the latter case, the relationship of the index to the net income series for which it is employed as an indicator is sometimes quite tenuous, resting on assumptions of an uncertain nature.

In **forestry**, quarterly estimates of net income are derived by distributing annual figures on the basis of quarterly farm cash income from the sale of forest products; current quarterly figures are obtained by projection on this index.

In **fishing**, estimates are obtained by the synthetic operating account method. Gross revenue is taken to be the value of fish caught and landed as compiled monthly by Fisheries Section of DBS. From this figure are deducted the values of expense items. The estimate of wages and salaries paid in fishing is described in the section "Wages, Salaries and Supplementary Labour Income". Quarterly estimates of depreciation are derived by straight-line interpolation between annual bench marks. For the current period, this involves forecasting the annual figure. Other expenses such as fuel and repair costs are moved according to the pattern of the value of fish caught and landed.

In **hunting and trapping**, the annual estimate is distributed evenly over the fall and winter months. For the current period this involves a forecast of the annual. The figure, however, is very small as is that of net income in **mining**. The latter is distributed and projected on an index which reflects price changes of minerals. In **manufacturing**, the annual estimates are distributed or projected on an index which reflects changes in wholesale prices of selected manufacturing commodities and changes in the number of working proprietors. In **construction**, net income of working proprietors is allocated and projected on a composite index which takes account of movements in the volume of construction and average weekly wages and salaries in construction.

Net income of **unincorporated retail stores** is estimated by applying sales-profit ratios to quarterly sales of unincorporated retail stores. For the years 1950-1952 the ratios are based on the quarterly corporation profits survey. For prior years, the annual net income figures are allocated according to the quarterly pattern established for 1950-52. An identical procedure is followed in estimating quarterly net income in **wholesale trade**.

Estimates of net income in **road transportation** are distributed or extrapolated on the basis of aver-

age weekly wages and salaries in urban and inter-urban transportation, adjusted to take account of numbers of working proprietors.

In **finance, insurance and real estate**, net income of stock and bond dealers is moved according to the value of shares traded on the Toronto and Montreal stock exchanges. Net income in insurance is derived by straight-line interpolation between annual estimates. Net income in other financial groups is distributed according to the movement of net income in the above two groups.

The various **service industries** constitute an important segment of the unincorporated field, but information respecting quarterly movements of net incomes for this group is fragmentary. The methods of estimation are therefore based on assumptions of uncertain validity.

In **laundry and drycleaning**, the estimates are linked to the movement of consumer expenditures in laundry service. Net income in barbering and hair dressing service is moved according to a composite index combining population figures with the index of barbers' fees from the consumer price index.

Net income in **undertaking** is based on an index combining the number of deaths with the consumer price index.

Net income in **hotels and tourist camps** is based on an index of employment in hotels and restaurants. In restaurant service, an index of total restaurant sales is used; net income in boarding and lodging is computed in the same way. Miscellaneous business and personal service is adjusted according to the movement of total business and personal service above.

5. Indirect Taxes Less Subsidies

Indirect taxes represent a part of the market price of goods and services which is not received by factors of production. They are, therefore, not included in the National Income, but must be added to factor costs to arrive at total costs entering into market prices.

Subsidies represent amounts contributed by government toward current cost of production. For this reason they must be deducted from factor costs to arrive at Gross National Product at market prices.

(a) Indirect Taxes

Federal indirect taxes consist of customs import duties, excise duties and taxes, taxes on corporations other than on profits, (e.g. bank note circulation tax and tax on net premiums of insurance companies), the business share of privileges, licenses and permits where no direct service by the government is involved, and the levy against farmers under

the Prairie Farm Assistance Act. With the exception of the latter item, all these data are available monthly on a collections basis from statements prepared in the office of the Comptroller of the Treasury. The quarterly figure is simply taken as the sum of the three relevant monthly figures. The Prairie Farm Assistance Act levy is obtained quarterly from the Board of Grain Commissioners.

In the case of **provincial indirect taxes**, a quarterly pattern of tax collections has been established for the years 1951 and 1952 on the basis of quarterly returns received from eight of the ten provinces. These quarterly patterns have been used to distribute the annual figures for the years 1951 and 1952, and the forecast annual figure for the year 1953. It is hoped that in the near future, it may be possible to obtain quarterly data from the provinces on a sufficiently current basis to permit direct quarterly estimates to be made for the current period, without a forecast of the annual.

For the years 1947 to 1950, the provincial quarterly estimates, for the most part, are derived by allocating the annual figure according to the movement of related indicators. Gasoline taxes are distributed in accordance with quarterly sales of taxable gasoline in the years 1947-1950, as reported to the Public Finance and Transportation Division (D.B.S.). Retail sales taxes are distributed according to the quarterly value of taxable retail sales (after adjustment for tax exempt sales) in the provinces in which the tax is levied (data from "Retail Trade" - D.B.S.). Tobacco taxes are divided according to quarterly releases of tobacco, as reported to the Industry and Merchandising Division, D.B.S. Real and personal property taxes are allocated equally to the four quarters of the year since they are considered to accrue on a day-to-day basis. All other taxes, including the business share of motor vehicle licences and permits, the amusement tax, taxes on corporations other than on profits, and miscellaneous taxes, licences, permits and public domain revenues, are allocated according to the 1951 pattern of tax collections.

Municipal indirect taxes consist mainly of real property taxes on owner-occupied and rented property. Again, these taxes are allocated evenly throughout the year. Municipal retail sales taxes are allocated according to the quarterly value of taxable retail sales in the provinces where they are levied. All other municipal taxes are allocated according to the pattern of the corresponding provincial taxes in 1951 and 1952. For current quarterly periods, these procedures involve a forecast of the annual.

(b) Subsidies

Direct subsidy payments by the federal government are obtained on a monthly basis from expenditure statements prepared in the office of the Comptroller of the Treasury; the quarterly figure is derived as the sum of the three relevant months.

Trading losses on operations of government commodity agencies are available only on an annual basis, and the quarterly estimates are derived by allocating the annual figures equally to the four quarters of the year. For the current quarterly period this procedure involves a forecast of the annual.

Provincial subsidies in all cases are allocated according to the pattern of 1951 and 1952 subsidy payments, as reported to D.B.S.

There are no subsidies paid at the municipal level.

6. Depreciation Allowances and Similar Business Costs

Allowances for current consumption of capital and similar non-cash charges, deducted to arrive at the profit, net rent, and net income components of the National Income, must be added back to arrive at Gross National Product at market prices. Current accounting allowances are used as a basis for the estimates, although these may vary widely from capital consumption in the economic sense.

For purposes of quarterly estimates, the annual figures for the years 1946 to 1951 are subdivided into their main components of depreciation, amortization and obsolescence; deferred depreciation; the claim portion of business and residential insurance; capital outlay charged to current expense; and net bad-debt write-offs. Each of these main components is then allocated to the four quarters of the year on the basis of interpolation techniques; for current quarters for which no annual data are available, the series are carried forward using either interpolating series or by mechanical projection. The sources and methods used are described in greater detail below.

In general, methods by which the quarterly estimates of depreciation are derived may be grouped into four main classes. The most important of these relies on the quarterly corporation profits survey, which is used in the years 1950-1952, for distributing or projecting the main components of depreciation for incorporated private companies, government business enterprises (based on the utilities group of private corporations) and unincorporated retail trade. For the years 1946 to 1949, it has been necessary to carry back the four quarter totals for the year 1950 by a technique which links them to the trend of the annual control series.

The second group of estimates relies on data prepared in connection with the estimates of net incomes of unincorporated businesses where a synthetic operating account method is employed to obtain the required figures. Thus, estimates of depreciation in agriculture and in fisheries are simply obtained from the expense side of the synthetic operating accounts. Estimates of depreciation are also made in connection with the figures of residential non-farm rents (included in investment income), and this series is used for non-farm residential depreciation.

A third class of estimate is based on the allocation or projection of the depreciation figures according to the movement of related indicators. Thus, capital outlay charged to current expense is allocated or projected according to the movement of quarterly investment in new machinery and equipment. Net bad debt write-offs are allocated or projected according to trend of corporation depreciation. Simi-

larly, the claim portion of business and residential insurance is linked to the trend of corporation depreciation.

The fourth class of estimate is that for which no quarterly information is available. The method employed here is one of interpolation through annual averages, with the current period estimates obtained by extension.

GROSS NATIONAL EXPENDITURE AT MARKET PRICES

1. Personal Expenditure on Consumer Goods and Services

This component comprises personal expenditure of Canadian residents, including implied expenditure out of income in kind, on consumer goods and services. All types of consumer durable goods are included. Purchases of houses, however, are regarded as capital goods, and are shown with the estimate of gross domestic investment. The rental value of owner-occupied houses is included, as are the operating costs of non-commercial institutions and life insurance companies (see page 86, National Accounts Income and Expenditure 1926-1950). The estimate includes expenditures of Canadian residents temporarily abroad, (e.g. tourists, members of the armed forces), but excludes expenditures of foreign residents temporarily in Canada. All expenditures that are regarded as business costs are excluded.

The estimates are calculated under three broad categories: commodities, services, and net expenditures abroad.

Personal Expenditure on Commodities

This estimate consists of purchases of commodities by persons, and implied expenditure out of income in kind. The general method of estimating quarterly purchases of commodities is to adjust the quarterly figure of total retail sales to exclude the value of non-personal purchases of commodities at retail, and to eliminate sales of second-hand merchandise not assignable to the production of the current quarter. Receipts from repairs and services are also subtracted from the total, since they are included with personal expenditure on services. Commodities purchased by individuals through non-retail outlets are added, as well as certain provincial and local taxes which are not included in the retail sales figure. The method of estimating each of the above component series on a quarterly basis is described in the following sections. In general, the procedure followed is to allocate annual figures on the basis of monthly retail sales or other data obtained from the various Divisions of D.B.S.; these data are also used to carry forward the quarterly series into current years for which annual information has not yet become available.

(i) Total Retail Sales

Quarterly estimates of total retail sales are derived by interpolation or projection of the annual figures on the basis of the monthly retail sales figures from the Industry and Merchandising Division.

(ii) Non-Personal Purchases at Retail

Non-personal purchases at retail, which are deducted from the estimate of total retail sales, are estimated quarterly by groups. The retail sales figures relevant to the group are used as the interpolating or extrapolating series for estimates of non-personal purchases of building and construction materials, hardware, office and store equipment, new commercial vehicles, passenger vehicles for business use, wholesale sales by retail establishments, tractors, farm implements and parts, hay, straw and feed, business purchases of gasoline, oil and grease. The value of meals and beverages charged to business and government expense accounts is allocated or projected according to the movement of labour income in manufacturing, wholesale and retail trade, and federal government departments. This information is obtained from the Labour and Prices Division. The cost of fuel used in heating rented dwellings is subtracted, being already implicitly included in the estimates of gross rents. The estimated quarterly amounts are computed in connection with the calculation of net rents in investment income.

(iii) Sales of Second-Hand Merchandise

Since Gross National Expenditure measures only sales of currently produced goods and services, it is necessary, in computing estimates of personal expenditure on consumer goods and services, to exclude the transfer value of sales of second-hand merchandise from total retail sales; only the "mark-up" value of such merchandise is properly included in the figures.

Sales of used automobiles by motor vehicle dealers are estimated residually; new vehicle sales, sales of gasoline, oil, grease, parts and accessories, and service (repair) charges are deducted from total sales of motor vehicle dealers to give an estimate of sales of used automobiles by motor vehicle dealers. All of the above estimates are

based on data available on a monthly basis from the Industry and Merchandising Division. To this figure it is necessary to add sales of used automobiles by used car dealers. This estimate is also based on monthly data supplied by the Industry and Merchandising Division. The total figures thus obtained are subtracted from aggregate retail sales to persons, and an estimate of mark-up is added back. The latter figure is arbitrary.

Sales of other used merchandise are allocated or projected according to the movement of quarterly retail sales.

(iv) Receipts from Repairs and Services

Since the estimates in this section refer wholly to commodities, repair and service receipts are deducted from the total of retail sales and included in personal expenditure on services below. The estimate consists mainly of repair and service receipts of garages and jewellery stores. The individual sub-groups are allocated or projected on the basis of the relevant store-type monthly retail sales.

(v) Commodities Purchased through Non-Retail Outlets

A significant volume of retail sales to individuals occurs through outlets not ordinarily classified as retail stores, and these must be added to the retail sales figures as derived above. Included here are retail sales by manufacturing bakeries and dairies (house to house deliveries). The annual data are allocated or projected: in the former case, on the basis of a combined index of employment, man-hours worked and prices in the bread and other bakery products industry; and in the latter case on the basis of a combined index of fluid milk sales and milk prices. Direct consumer sales by farmers are also added insofar as estimates can be made; direct sales of fuel wood to consumers by farmers is moved according to farm cash income from the sale of forest products (Agriculture Division).

Refinery sales of fuel oil and kerosene to consumers are correlated with a combined index which takes account of domestic consumption of petroleum products used as fuel, and fuel oil prices. Sales of coke and coal to consumers by wholesale firms are distributed according to the movement of retail sales of coal and wood dealers (Industry and Merchandising Division).

Consumer purchases in railway dining and buffet cars are distributed or projected according to the movement of total passenger operating revenues of all Canadian railways obtained from the Public Finance and Transportation Division. Purchases of alcoholic beverages through hotels and public houses are related to monthly sales of alcoholic beverages (collected by the Industry and Merchandising Division). Purchases of meals and merchandise through hotels are distributed in accordance with the movement of retail sales of restaur-

rants, obtained from the Industry and Merchandising Division. Retail sales by manufacturers not otherwise classified are allocated on the basis of total retail sales. Retail sales by wholesalers are divided into food and other; the food group is distributed in accordance with monthly retail sales of grocery, combination and meat stores, while other sales are moved in accordance with the grand total of retail sales. Commodity sales by service establishments such as garages are distributed in accordance with the movement of an index which takes account of monthly retail sales of garages and filling stations, and other retail sales.

(vi) Provincial and Local Taxes

In general, retail sales estimates include federal sales and excise taxes, but do not include certain types of local and provincial sales taxes. These must therefore be added to bring the estimates of retail sales to persons to a "market price" valuation. Data are obtained in connection with the quarterly estimates of "indirect taxes".

(vii) Income in Kind, Goods

An imputation is made to personal expenditure of the value of goods consumed out of income in kind. In each case the figures included in expenditure are based on the quarterly estimates used for the income side. The estimate of food and fuel consumed on farms is a part of the calculation of net farm income prepared by the Agriculture Division. Food received and consumed by non-agricultural workers is computed in connection with the estimates of wages, salaries and supplementary labour income. The value of lodging supplied to both farm and non-farm workers is not included here, being classified to the "services" estimate. Estimates of food and clothing issued to the armed forces are prepared in connection with the figures of military pay and allowances.

Personal Expenditure on Services

This includes the value of services rendered directly to individuals as distinct from those rendered to business or to government. The general method of estimating the quarterly figure is to allocate the annual benchmark on the basis of an interpolating series, and to carry the resulting quarterly estimate forward to the current period by projection.

(a) Estimates Based on Actual or Directly Related Information

For certain classes of services fairly reliable data are available to serve as the interpolating or projecting series. Bridge, tunnel and ferry tolls are distributed in accordance with Canadian re-entries at border points; expenditure for transportation on steam railways, electric railways and buses, and air carriers, in accordance with monthly passenger operating revenues; expenditure for postal service in accordance with monthly post office revenues;

expenditure on express service, in accordance with express operating revenues of railways; expenditure on electric power, in accordance with a combined index of power consumption and the price of electric power; and expenditure for household gas, in accordance with domestic sales to households.

related to the estimates of net income of the professional service groups (see "Net Income of Unincorporated Business").

Personal expenditure for commercial and trade school instruction is based on calculations made for wages, salaries and supplementary labour income estimates.

(b) Estimates Explicitly Articulated with the Income Side

Other service groups included in the estimates of personal expenditure on services are explicitly articulated with the income side of the Accounts, the estimates being computed in connection with the calculations of components of the Gross National Product. Gross farm and non-farm residential rents, paid and imputed, are calculated in connection with the rent component of investment income. Wages and salaries (including income in kind in the form of food received), of domestic servants, are calculated in connection with the estimate of wages, salaries and supplementary labour income.

The value of free lodging supplied to non-agricultural workers occupying non-residential property such as bunk-houses, hotels and steamships, is added as imputed expenditure. The calculation is made in connection with wages, salaries and supplementary labour income.

Personal expenditures for banking services, both paid and imputed, are obtained from the Bank of Canada. Imputed banking services are entered explicitly in the calculations of investment income.

Personal expenditure for board and lodging is taken as being equal to net income from boarding and lodging, which is included in net income of unincorporated business. The figure is included on a net basis in this case since expenses relating to boarding and lodging are already included in personal expenditure for food, rent, fuel and so forth.

Estimates of personal expenditure for services of physicians and surgeons, dentists, nurses, lawyers, and miscellaneous health services, are all

(c) Estimates Based on Indirect Evidence

A substantial part of the services estimate is allocated according to the movement of series which are not directly related to the data to be distributed. For the most part, the methods used for this group of estimates have had to be based on certain assumptions concerning relationships. The fact that these assumptions are often quite tenuous must be taken into account in assessing the quality of this group of estimates. The major components included here, and the interpolating or projecting series are summarized in the following table:

Component	Interpolator or Projector
1. Automobile repairs and maintenance	Retail sales of garages and filling stations.
2. Barber shop and beauty parlour services	Index combining population and price index of haircuts, shampoos.
3. Cables and telegrams	Straight line trend.
4. Dressmaking	Straight line trend.
5. Furniture and upholstery repairs	Retail sales of furniture.
6. Funeral and burial services and cemeteries	Combined index of consumer prices and total number of deaths in Canada.
7. Hospital service	Index of hospital fees.
8. Jewellery repairs and engraving	Retail sales of jewellery stores.
9. Moving expenses	Straight line trend.
10. Radio and appliance repairs	Retail sales of radios and appliances.
11. Recreation (all types)	Net "sales" of selected motion picture theatres (corporation profits survey).
12. Shoe cleaning and repair	Retail sales of shoe stores.
13. Taxi service	Price index of taxi fares.

Net Personal Expenditure Abroad

This net adjustment is necessary to include, in personal expenditure, the expenditure of Canadian residents in foreign countries, and to exclude the expenditures of non-residents in Canada. The adjustment covers net expenditures of members of the armed forces, as well as net tourist expenditures. In addition, net private remittances to non-residents are included to correspond to the contra-entry in the balance of payments component. To the extent that gifts in kind sent abroad do not appear in retail sales (e.g. Red Cross parcels) an estimate of their value is also added.

The data are obtained from the Balance of Payments Section, Dominion Bureau of Statistics, and the Department of National Defence.

2. Government Expenditure on Goods and Services

This component consists of the outlays of federal, provincial and municipal governments (including municipal school corporations) for currently produced goods and services. The figure is essentially a residual one, derived by eliminating from government budgetary expenditures all outlays which are not made directly to purchase new goods and services, that is, subsidies, transfer payments to individuals and private non-commercial institutions, transfers to other governments, losses of government-owned enterprises, reserves, write-downs, and other bookkeeping adjustments. The expenditure of the Post Office Department is also eliminated since this agency is treated in the National Accounts as a government business enterprise. Certain adjustments are then made to this residual figure to bring it into line with the concept of "current" production followed in the National Accounts. Finally, government expenditures on goods and services which take place outside the framework of the budgetary accounts are added.

At the federal level, all of the budgetary data necessary to carry out the above procedure are available from monthly expenditure statements of the Comptroller of the Treasury. It should be noted that expenditures charged in the supplementary period of the fiscal year by the Comptroller of the Treasury are divided equally between the first and second quarters in the National Accounts figures. Although the bulk of the supplementary payments relate to first quarter transactions, (the Treasury books being held open after this period to permit payment with respect to transactions completed prior to March 31), the mechanics by which a number of related series are recorded in the National Accounts (e.g. imports, change in inventories) requires that, for consistency, an adjustment be made to include a part of supplementary period outlays in the government expenditure component in the second quarter. The exact amount of the required adjustment is not known, but it is estimated to be approximately one-half of the total supplementary period payment.

In addition, adjustments are made to eliminate amounts charged to the defence appropriation which are not related to current production. Thus, ship-

ments from stocks of previously produced military equipment to NATO countries are reflected in the government accounts as budgetary expenditure, and it is necessary to delete these amounts and to add back the outlay for new goods and services made from the Defence Equipment Replacement Account; the latter are not included in the government accounts as expenditure. An adjustment is also made to allocate government housing expenditure for the armed services to the quarter in which the actual construction was carried out.

Federal extra-budgetary expenditures on goods and services are added to these figures. Included here are net purchases of inventories by various government commodity agencies such as the Agricultural Prices Support Board, and from the Defence Production Revolving Fund. Information is obtained quarterly from the Departments of Agriculture and Defence Production. Expenditures of agencies such as the Canadian Broadcasting Corporation, which are not treated as government business enterprises, are also added. These figures are derived quarterly by allocating the annual data evenly throughout the year; for current periods, this involves a forecast of the annual figure.

At the provincial level, a quarterly pattern of provincial government expenditure on goods and services has been established for the years 1951 and 1952 on the basis of quarterly returns received from eight of the ten provinces. The 1951 quarterly pattern has been used to distribute the annual figures for the years 1947 to 1951; and the 1952 pattern has been used for the year 1952 and for the forecast annual figure for the year 1953. It is expected that in the near future, quarterly data will be available from the provinces on a sufficiently current basis to permit direct quarterly estimates to be made for the current period without recourse to a forecast of the annual figure.

No data are available on the quarterly movements of municipal government expenditures. These have therefore been distributed according to the 1951 and 1952 provincial patterns, it being assumed that the movement in the municipal data follows closely the pattern of provincial expenditure on goods and services. This assumption is realistic, since the same seasonal factor is present in the capital outlays of both provincial and municipal governments, and current day-to-day administrative expenses are fairly constant from quarter to quarter at both levels of government.

3. Gross Domestic Investment

Gross domestic investment, as defined in the National Accounts, includes expenditures for new construction, new machinery and equipment, and changes in inventories of private and government business enterprises and private non-commercial institutions. Expenditures of persons for new housing (including major improvements and alterations) are also included, since individuals, in their capacity as home-owners, are treated as business enterprises. Thus, this component covers gross capital

formation (including changes in inventories) of the private sector of the economy, and government business concerns. Expenditure on new construction and equipment for general government purposes is excluded from gross domestic investment since it is included in the component "government expenditure on goods and services".

(a) Investment in Durable Assets (New Construction, Machinery and Equipment)

In general, the quarterly figures of gross domestic investment in durable assets are obtained by allocating annual data on the basis of specially constructed indicators; for current quarters for which no annual data are available, the series are carried forward according to the movement of these indicators. The interpolating (or extrapolating) series are prepared for each of the main components of the annual figures: new residential construction, new non-residential highway and railway construction, new non-residential building and other construction, and new machinery and equipment.

In the case of **new residential construction**, a slight departure in method is made. A series of value estimates of total new residential construction in Canada, (both government and private) is prepared by the Economic Research Branch of Central Mortgage and Housing Corporation, using a formula which takes into account D.B.S. data on starts and completions of houses, numbers of houses under construction, and a weighted series of wage rates of construction workers and residential building material prices. Quarterly data on the various types of government financed residential construction (the value of which is included with "government expenditure on goods and services") are also obtained from Central Mortgage and Housing Corporation. The quarterly figures of gross domestic investment in new residential housing as per the National Accounts are derived by taking the difference between the total series and the government series, as estimated above. In cases where the sum of the four quarters does not equal the annual figure used in the National Accounts, the quarterly series are adjusted to the annual level.

Quarterly estimates of **new non-residential highway and railway construction** are obtained by interpolation of the annual data on the basis of a composite index which incorporates data on employment and average hours worked in the railway and highway construction (volume component) and prices of construction materials and average hourly earnings (price component). For current years, prior to preparation of annual estimates, the index is used to project the latest available annual estimate.

Quarterly estimates of **new non-residential building and other construction** are obtained by interpolation on the basis of a composite index which takes account of employment, average hours worked, building material prices, and average hourly earnings of construction workers. An adjustment is made to

the value series to eliminate defence construction, which is included with "government expenditure on goods and services". For current years, the index is used to project the latest available annual estimates.

New machinery and equipment is obtained on a quarterly basis by projection from a 1948 benchmark using appropriate related indexes. The 1948 benchmark is based on data reflecting "available supply", i.e. total production of various types of machinery and equipment adjusted to exclude exports and to include imports. These base period values are prepared in considerable detail (e.g. agricultural implements, hardware and tools, railway rolling stock, shipbuilding) and are then extended to other years on the basis of relevant indexes. The indexes are prepared by the Commodity Section of the Industry and Merchandising Division, and the General Assignments Division. An adjustment is made to the final series to eliminate defence purchases of aircraft, ships and machinery, which are included in the component "government expenditure on goods and services". The information is supplied by the Departments of National Defence and Defence Production. The estimates are prepared in collaboration with the Economics Division of the Department of Trade and Commerce.

(b) Change in Inventories

The net change during the quarter of holdings of inventories must be recorded in the Gross National Expenditure in order to allow for that portion of current production which remains unsold at the end of the quarter (positive change in inventories), or to eliminate that portion of previous quarters' production which is included in sales of the current quarter (negative change in inventories). These changes represent net investment or disinvestment in inventories by private businesses, and government business enterprises. Investment in grain inventories by the Canadian Wheat Board is included, but investment in inventories by various government commodity agencies not organized as business enterprises is excluded¹. The latter is shown with government expenditure on goods and services.

The methods of estimation in the inventory sector may be classified under three general headings: (i) business inventories; (ii) farm inventories; and (iii) grain in commercial channels. The method employed in the case of business inventories is to obtain quarter-end book values of inventory holdings in each industry, and to calculate the change in inventories between these quarter-ends. In most industries, such as manufacturing, retail and wholesale trade, and to some extent in forestry and mining, the quarter-end book values are based on monthly surveys carried out by the Commodity and

1. These include Commodity Prices Stabilization Corporation, Canadian Wool Board, Special Products Board, Meat Board, Dairy Products Board, Agricultural Prices Support Board, Agricultural Products Account and Fisheries Prices Support Board.

Merchandising Sections of the Industry and Merchandising Division. In other industries, such as construction, public utilities, and finance, insurance and real estate, quarter-end book values are obtained by interpolation between annual benchmarks, using related information; for current quarters, the estimates are obtained by projection.

In the case of inventories held on farms and grain in commercial channels, the value of the physical change, rather than the change in book values, is used. Theoretically, the basis of computing all inventory changes in the National Accounts should be "the current value of the physical change", but at the present time this procedure has been applied only to farm inventories and grain in commercial channels¹

(i) Method of Estimating Business Inventories by Industrial Groups

In **forestry**, quarterly physical volume data on logs held by pulp and paper mills and sawmills are obtained from surveys carried out by the Forestry Section of the Bureau. Prices to value these physical stocks are obtained from the same source. The calculated quarterly book values are then used to interpolate between annual levels, and for projection to current quarters.

In computing the book values of **mining** inventories, calculations are made separately for finished goods and raw materials. For finished goods, quarter-end holdings of physical inventories at iron ore, asbestos and coal mines are obtained from the Mining, Metallurgical and Chemical Section of the Industry and Merchandising Division. Price series to value the physical stocks are obtained from the Prices Section of the Bureau. The resulting quarter-end book values are used to interpolate between annual benchmarks, and for projection to current quarters. Quarterly inventory holdings of raw materials are assumed to move between annual benchmarks in accordance with an index of payrolls in the mining industry. The sum of the two series so computed constitutes the book values of total inventories held in the mining industry.

Book values of inventories held by **manufacturing** industries are calculated quarterly (and monthly) by the Commodity Section of the Bureau. The data are based on a fairly comprehensive monthly sample survey of manufacturing industries. For each industry contacted, the information obtained quarterly is used to interpolate between benchmarks resulting from annual surveys, or to carry forward the series to current quarters. For small industries not surveyed, quarterly inventory holdings are estimated on the trend of related industries. The results are then summed for all industries, and the change in inventories is calculated as the difference between quarter-to-quarter holdings. Government progress pay-

ments are excluded from the value of inventory investment since they are included with government expenditure on goods and services. Trading inventories of manufacturers' own products are included with wholesale trade rather than with the relevant manufacturing industry.

Quarterly estimates of inventories of building materials held by **construction** contractors are based on the movements of construction employment and a 3-month average of building material prices. Information is obtained from the Employment Section of the Bureau, and from the Prices Section. The resulting series is used to interpolate between annual benchmarks, and for projection.

In **transportation, storage and communication**, quarterly inventory holdings are assumed to move along the trend of Canadian National Railways and Canadian Pacific Railways inventories. Information is also obtained on inventories of building materials and equipment held by telephone companies. The resulting information is used to interpolate between annual benchmarks, and for projection.

The method of estimating quarterly inventories held by **public utilities** is to interpolate between annual benchmarks using a 3-month moving average of employment in public utilities; for current quarters, the estimates are carried forward using a similar method. The data on employment is obtained from the Employment Section of the Bureau.

Quarterly data on holdings of **wholesale** inventories by nine trade groups² are obtained from the Merchandising and Services Section of the Dominion Bureau of Statistics and are based on a sample, of which the overall coverage is inadequate. Physical volume data on holdings of coal are obtained from the Dominion Coal Board and valued at prices obtained from the Prices Branch. Physical stocks of petroleum are obtained quarterly from the Mining, Metallurgical and Chemical Section of the Bureau and again valued at prices obtained from the Prices Section. No information is available concerning durable goods inventories, consequently plumbing and heating equipment and electrical apparatus inventories, are based on the trend in the hardware group. Wholesale stocks of jewellery and furniture are assumed to move in relation to retail holdings of these two commodities. The various inventory series computed above are summed, and the resulting series used to interpolate between annual benchmarks, or for projection to current quarters.

Most of the quarterly information concerning holdings of **retail inventories** in chain stores, department and mail order stores, and independent stores, is based on monthly surveys carried out by the Merchandising and Services Section of the

1. See "National Accounts, Income and Expenditure, 1926-1950", pages 112-114.

2. Auto parts and equipment, drugs, clothing, footwear, dry goods, fruits and vegetables, groceries, hardware, tobacco and confectionery.

Bureau. In the case of the first two types of store, monthly coverage is very close to a complete survey of the universe, but in the case of independent stores the coverage is rather incomplete. However, information is available for most of the important trades; in the smaller trades not covered by the survey, the estimates are based on the movement of stocks in related industries. Information on physical stocks of coal is obtained from the Dominion Coal Board, and valued at prices obtained from the Prices Section. For retail inventories of new cars, the disappearance concept is used; physical shipments from factories are adjusted for exports, imports and retail sales, the inventories being obtained residually; prices to value these physical stocks are obtained from "Motor Vehicle Sales and Financing" (DBS). All the series described above are added, and the resulting series used to interpolate between annual benchmarks or for projection to current quarters.

No information is available with respect to inventory holdings of **finance, insurance and real estate** and the **service** groups. They are assumed to move in accordance with the quarterly trend of the total of the manufacturing, wholesale, retail and grain in commercial channels groups.

(ii) Farm Inventories

The change in **farm inventories** is calculated by applying average quarterly farm prices to the physical change in grain stocks, and quarter-end prices to the physical change in holdings of livestock. As indicated on page 53, the quantity and price data which permit this calculation are based on surveys carried out by the Agriculture Division of the Bureau. Thus, the change in farm inventories is recorded in the National Accounts as the current value of the physical change.

(iii) Grain in Commercial Channels and Inventory Valuation Adjustment

As previously noted, the current value of the physical change in inventories of **grain in commercial channels** is also used in the National Accounts, rather than the change in book values. The value of the physical change is obtained by multiplying the quantity change in inventories by the average initial price paid to producers during the quarter by the Canadian Wheat Board, in the case of wheat, and by average market prices (Winnipeg Grain Exchange data) in the case of coarse grains. The calculation is computed separately for each grade of wheat involved, but is carried out for the total only in the case of coarse grains. The sum of the four quarterly estimates constitutes the final annual figure, and no adjustment is necessary to bring the quarterly data to the correct annual level.

Because the profits of the Canadian Wheat Board and private grain dealers are computed on the basis of changes in book value of inventories, an "**inventory valuation adjustment**" must be made to the income side to retain the statistical and theoretical balance of the accounts (see page 52).

The inventory valuation adjustment for grain in commercial channels is obtained by subtracting the change in book value from the value of the physical change as computed above. The change in book value of inventories of grain in commercial channels is obtained by multiplying the physical stock at the beginning and end of each quarter by quarter-end initial prices paid to producers, and differencing the results. In the case of wheat, the calculation is made separately for each grade.

4. Exports Minus Imports (Net Investment or Disinvestment Abroad)

Because a part of Canada's current production of goods and services is sold to non-residents, it is necessary to add the value of exports to arrive at a final accounting of current production through sales. Conversely, because sales to persons, governments, business on capital account and non-residents, include goods and services produced by non-residents, i.e. imports, it is necessary to subtract these in order to arrive at a correct valuation of Canadian output.

It should be noted that the terms "exports" and "imports" are used here in a broad sense to include both goods and services; interest and dividends received from non-residents are regarded as receipts for the service of capital and are included with the "export" series, while interest and dividends paid to non-residents are regarded as payments for the service of capital and are included with the "import" series. It will be recalled that adjustments corresponding to these dividend and interest transactions are made to investment income on the income side of the National Accounts. In addition, gold available for export, tourist and travel expenditures of non-residents in Canada, freight and shipping credits earned on Canadian account and various receipts for business services are included in the "export" figures; tourist and travel expenditures of Canadians abroad, and freight and shipping charges and business service costs incurred by Canada on foreign account are included with the "import" series.

The quarterly figures appearing in the National Accounts are the gross receipts and payments on current account prepared by the Balance of Payments Section of the Bureau. These figures are available in much the same detail as is normally published on an annual basis in the report "The Canadian Balance of International Payments". For current quarters, only one adjustment is necessary to bring these figures into line with National Accounts definitions; emigrants' capital and inheritances are deducted from gross current debits (imports), and immigrants' capital and inheritances are deducted from gross current credits (exports). These unilateral items do not represent payments for goods and services, nor are they related to the current earnings of Canadian or foreign factors of production; they are treated as transfers of capital which are not included in the National Income, (although

they occur with sufficient regularity to be considered as "current" transactions for Balance of Payments purposes).

The resulting balance on current account, after allowing for these adjustments, is sometimes referred to as Canada's net investment or disinvestment abroad. A favourable (positive) balance on current account implies borrowing from Canada or Canadian "investment" abroad to finance the deficit of the rest of the world; an unfavourable (negative) balance implies borrowing by Canada, or Canadian "disinvestment" abroad, to finance Canada's deficit.

For a detailed description of the sources and methods used by the Balance of Payments Section of the Bureau, reference should be made to "The Canadian Balance of International Payments, 1926 to 1948", Dominion Bureau of Statistics, 1949, and

also to "The Canadian Balance of International Payments in the Post-War Years, 1946-1952", Dominion Bureau of Statistics, 1953.

5. Residual Error of Estimate

As has been indicated, substantially independent estimates are made for the Gross National Product and the Gross National Expenditure. Since both of these aggregates measure the value of goods and services produced by Canadians in a given quarter, they should add up to the same sum. In fact, however, there is a statistical discrepancy between the two totals due to the shortcomings in available statistics. On the assumption that the "best" estimate of the common total is half way between the two independently computed totals, the statistical discrepancy is divided into two equal parts and one-half is allocated to each of the two sides of the account under the heading of "residual error of estimate". In this manner, balance is achieved between the two sides of the account.

QUALITATIVE SUMMARY OF METHODS

By way of summary, the following table is designed to give the users of the quarterly estimates a synoptic view of the quality of the data. The table expresses in quantitative terms the relative reliability of the estimates of the various major components. It will be noted that both the Gross National Product and Gross National Expenditure are almost identical in terms of the proportion of the material which is based on survey data or regular accounting records, on reliable related data, and on tenuous assumptions or judgment. Although complete exactitude cannot be attached to the figures, they do express in a broad way the stat-

istician's view of the general order of qualitative precision of the constituent series.

The second quarter of 1952 was selected as being representative of a typical quarter of a year for which annual data had not (at that time) become available. Among the qualitatively less reliable series, the following may be noted: the inventory and expense component of accrued net farm income; the greater part of net income of unincorporated business; personal expenditure on services; and municipal government expenditure on goods and services.

Qualitative Summary of Methods

2nd Quarter 1952

	Based on survey data or regular ac- counting records	Based on reliable related data	Based on tenuous assumptions or judgment	Total
	(1)	(2)	(3)	(4)
		Per cent		
Wages, salaries and S.L.I.	87.0	8.1	4.9	100.0
Military pay and allowances	100.0	—	—	100.0
Investment income	77.8	11.9	10.3	100.0
Accrued net income of farm operators	64.5	11.2	24.3	100.0
Other unincorporated net income	5.1	37.6	57.3	100.0
Indirect taxes less subsidies	73.0	24.1	2.9	100.0
Depreciation allowances	49.9	17.7	32.4	100.0
Total (weighted)	71.9	13.3	14.8	100.0
Personal expenditure on consumer goods & services	80.6	4.3	15.1	100.0
Government expenditure on goods and services	75.7	3.8	20.5	100.0
Gross domestic investment in durable assets	14.1	71.1	14.8	100.0
Change in inventories	62.9	27.5	9.6	100.0
Exports of goods and services	89.3	8.4	2.3	100.0
Imports of goods and services	87.2	9.3	3.5	100.0
Total (weighted)	72.2	15.7	12.1	100.0

SECTION 2

NOTES ON SEASONALLY ADJUSTED NATIONAL ACCOUNTS DATA

Seasonal variation may be viewed as a "repetitive intra-annual fluctuation"¹. The majority of the time series given in Tables 1-4 of this report exhibit clearly defined seasonal patterns, which recur with characteristic regularity. Such fluctuations reflect the influence of a variety of factors. Climatic conditions, for example, influence the production and marketing of crops, the intensity of cutting operations in the woods, the purchase of winter and summer clothing, the shipment of commodities through the St. Lawrence River, and so on. The observance of Christmas and Easter is reflected in the buying habits of consumers, with levels of purchasing fluctuating sharply in these periods. Trade practices also exert their influence—for example, the dates of the annual appearance of new automobiles are an important factor in the seasonal movement of automobile purchases. Thus, climate, social institutions, trade practices and a myriad of other factors all generate "repetitive intra-annual fluctuations" in statistical time series.

In dealing with a time series in which such seasonal fluctuations occur, it is usually difficult to detect the basic underlying movements of the data since these are often obscured or hidden by the regular seasonal upswing or downturn. Thus, in order to isolate turning points or trends in the basic economic situation, it is necessary to eliminate the effects of seasonal movements from economic data. Although this "elimination", or seasonal adjustment, can be made in approximate terms only, seasonally adjusted data nevertheless provide an important aid in the analysis of time series and can shed considerable light on underlying trends or tendencies in the economy.

A discussion of some of the basic assumptions involved in the process of seasonal adjustment may be helpful in obtaining a better perspective of the limitations inherent in seasonally adjusted series. For a variety of reasons, production or consumption does not take place in the economy in a perfectly smooth fashion; rather, changes through time are in different directions, and of different magnitudes. Thus, if production were measured in a plant on an hourly basis, none would be recorded for non-working hours; on a daily basis, no production would show for Sundays, were that a non-working day. Monthly figures would show the effects of holiday shutdowns, and changes due to seasonal levels of demand. Thus, it is apparent that fluctuations in the data will appear depending upon both the time period chosen and the basic causes of these fluctuations.

Quarterly data will fluctuate in accordance with a number of factors: long-term growth and structural

changes, cyclical changes, seasonal influences and erratic events. If it can be assumed that the seasonal influences inherent in the economy are of a stable, repetitive character and are therefore measurable, then it should be possible to isolate the remaining influences by removing the seasonal variation. The examples noted previously would tend to confirm the assumption of stability in seasonal patterns; the eight-hour day, the Sunday holiday, Christmas, Easter, cold and warm weather, and so on, are all factors of a stable, repetitive character. As long as these factors remain relatively constant it is possible to measure their influence. At the same time, it is obvious that a multitude of other factors affect economic processes and that among these are factors of a random nature. It therefore follows that the more observations there are available from a longer time period, the less chance of any one random factor affecting the measurement of seasonality; and conversely, that the fewer observations available, the less confidence we can place in any averages used to obtain a seasonal pattern.

In utilizing the seasonally adjusted data given in this report, three distinct limitations must be kept in mind. Firstly, the assumption that the inherent structure of the economy yields a relatively stable seasonal variation must be modified by the possibility of a change in the original conditions, the discovery of which requires a period of hindsight. Secondly, the relatively small number of observations to which we are sometimes restricted tends to increase the relative influence introduced by a random event. For these reasons, the work of seasonal adjustment is a continuing process, so that any underlying changes may be worked into the pattern. Finally, the judgment of the statistician is often involved in decisions relating to statistical techniques, the elimination of extreme items, whether or not a true seasonal exists, where a break occurs in the pattern, and so on. It is not possible to replace this element of subjective control by completely mechanical procedures.

General Approach

At the outset, it was decided to break down the major components of the National Accounts into item detail, wherever possible; when seasonally adjusted, these items were summed to give adjusted major components. This was done to ensure that all possible knowledge of each individual sub-series was utilized, for it is apparent that combined series, representing combinations of seasonal movements, are not so readily amenable to analysis.

Once the item breakdown was provided, those series manifesting seasonal characteristics were sorted out from those which showed no seasonal.

1. Burns and Mitchell, *Measuring Business Cycles*, National Bureau of Economic Research, New York, 1946, p.44.

This was done largely by inspection, or on the basis of the known economic characteristics of the particular sub-series. That is, if a series showed no seasonal movement, and from a study of production, marketing and social factors, it was apparent that no seasonality should be present, then it was felt that no seasonal adjustment was necessary.

The short period covered by the data was an important limitation to overcome, for the appearance of a single irregular item in a series is sufficient to distort the seasonal index. This problem was met to some extent by developing data prior to 1947 for many of the series; in some cases a closely related series was used, which could be expected to follow a similar pattern. Three periods were distinguished: 1947-1952, 1939-1945, and 1930-1939. In many instances, World War II obliterated any seasonal pattern, and in others, the changed economic pattern due to the War resulted in a different seasonal pattern after 1947. There were three types of series which resulted:

- (1) Similar pattern in all three periods.
- (2) Different pattern of a temporary nature during 1947-1952.
- (3) Different pattern of a stable nature during 1947-1952.

Type (1) resulted in a seasonal index which could be used with considerable confidence. Type (2) called for some special adjustments to be made. A typical example was consumer expenditure on new automobiles. From 1935 to 1939, heavy purchases in the second quarter of the year dominated the pattern. But the postwar pattern, affected by heavy demand, showed a secular rise, quarter by quarter, and it was not until 1949 that the pattern began to revert to that of the prewar period. For 1947 and 1948, therefore, no seasonal adjustment was made. For Type (3), an analysis usually indicated the reason for any permanent change; where this was so, the index could be used with confidence. An example of Type (3) occurs in the series of wages and salaries in logging, which showed considerably less amplitude in its seasonal movements in the post-war period. This was due to the intensification of mechanized cutting and loading techniques, permitting more extensive summer operations.

Methods of Measurement

There are a variety of methods for measuring seasonal variations. Percentages of trend line, link-relative, graphic and ratio-to-moving average methods are all approved techniques¹. The short period covered by our data, and the sharp changes caused by aftermath of World War II precluded using a percentage-of-trend-line technique. While the link-

relative method has much to commend it, it is adapted only to series showing constant rates of growth; further, it is not too adaptable to the construction of moving seasonals which were necessary for adjusting many of the series. Graphic methods are useful techniques and these were combined with the ratio-to-moving average method for use in adjusting the data².

Before proceeding to outline in detail the steps in a typical example of the deseasonalizing procedure, a condensed explanation may be helpful. The first stage in the procedure was to run a centred four-quarter moving average through the series. The resulting relatively smooth line may be taken to represent approximately cyclical and trend elements. The deviations above and below this line represent seasonal, random, and irregular factors. Most frequently, the deviations were quite regular, and the pattern of seasonal variation about the smooth line of the moving average was readily apparent on a chart. The crucial step of the deseasonalizing process was to obtain an average pattern of the variations about the moving average; more will be said about this below. Having obtained an average pattern, this was then applied to the original raw data, thus removing the seasonal element and yielding a smoothed series. This usually involved the division of the original data by a ratio representing the amount of the seasonal adjustment for each quarter.

The seasonal adjustment ratios or average patterns were arrived at in a variety of ways. The simplest method was to average all of the first quarter deviations, then all of the second quarter deviations, and so on. Modified averages were frequently used, which means that extraordinary deviations (due to assignable non-seasonal causes) were struck out before averaging the deviations for any particular quarter in successive years. As an initial step, however, all deviations of first quarters, and second quarters, and so on were first plotted consecutively on a graph, so that if there was a tendency for the first quarter deviation to diminish or expand, this could be seen. Where this was the case, a free hand line was drawn on the chart, so placed as to fit the scattered points as closely as possible. The seasonal adjustment ratio for the first quarter (which changed gradually from year to year) was then read off this line. However, in the majority of cases, there was no tendency for the seasonal pattern to change, so that, as previously indicated the reading simply consisted of an arithmetic average of the deviations. The same procedure was followed for the second quarter, the third quarter and the fourth quarter adjustments. These readings explain column 6, "reading from chart" in the following numerical example.

1. For a description of these various techniques, see Croxton and Cowden, *Applied General Statistics* (New York, 1942), Chapters XVII and XVIII.

2. See *Federal Reserve Bulletin*, June 1941. "Adjustment for Seasonal Variation", pages 518-528.

Component: Personal Expenditure on Consumer Goods and Services

Component Item: Jewellery and Watches

Date	Original data (mil- lions)	4Q moving total of (1)	2Q moving total of (2)	Centered moving average = (3) ÷ 8	Ratio to moving average = (1) ÷ (4)	Reading from chart	Adjust- ment factor = 400 ÷ an- nual total	Seas- onal index = (6) × (7)	Seasonally adjusted series = (1) ÷ (8)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1947									
1Q	11.3	—	—	17.0 ^e	69.4	69.0	1.00502	69.3	17.0
2Q	14.2	—	—	17.1 ^e	83.0	83.0	1.00502	83.4	17.0
3Q	15.3	68.8	138.0	17.2	88.9	90.0	1.00502	90.5	16.9
4Q	27.5	59.2	138.5	17.3	158.9	156.0	1.00502	156.8	17.5
Year	68.8	—	—	—	—	398.0	—	400.0	68.4
1948									
1Q	12.2	59.3	139.6	17.4	70.1	69.0	1.00502	69.3	17.6
2Q	14.3	70.3	140.7	17.5	81.7	83.0	1.00502	83.4	17.1
3Q	16.3	70.4	141.0	17.6	92.6	90.0	1.00502	90.5	18.0
4Q	27.6	70.6	143.2	17.9	154.1	156.0	1.00502	156.8	17.6
Year	70.4	—	—	—	—	398.0	—	400.0	70.3
1949									
1Q	12.4	72.6	145.4	18.1	68.5	69.0	1.00502	69.3	17.9
2Q	16.3	72.8	147.6	18.4	88.5	83.0	1.00502	83.4	19.5
3Q	16.5	74.8	150.4	18.8	87.8	90.0	1.00502	90.5	18.2
4Q	29.6	75.6	151.3	18.9	156.6	156.0	1.00502	156.8	18.9
Year	74.8	—	—	—	—	398.0	—	400.0	74.5
1950									
1Q	13.2	75.7	153.7	19.2	68.8	69.0	1.00502	69.3	19.0
2Q	16.4	78.0	157.5	19.7	83.2	83.0	1.00502	83.4	19.7
3Q	18.8	79.5	160.8	20.1	93.5	90.0	1.00502	90.5	20.8
4Q	31.1	81.3	163.5	20.4	152.5	156.0	1.00502	156.8	19.8
Year	79.5	—	—	—	—	398.0	—	400.0	79.3
1951									
1Q	15.0	82.2	163.4	20.4	73.5	69.0	1.00502	69.3	21.6
2Q	17.3	81.2	164.1	20.5	84.4	83.0	1.00502	83.4	20.7
3Q	17.8	82.9	165.3	20.7	86.0	90.0	1.00502	90.5	19.7
4Q	32.8	82.4	165.6	20.7	158.5	156.0	1.00502	156.8	20.9
Year	82.9	—	—	—	—	398.0	—	400.0	82.9
1952									
1Q	14.5	83.2	167.3	20.9	69.4	69.0	1.00502	69.3	20.9
2Q	18.1	84.1	171.8	21.5	84.2	83.0	1.00502	83.4	21.7
3Q	18.7	87.7	—	—	—	90.0	1.00502	90.5	20.7
4Q	36.4	—	—	—	—	156.0	1.00502	156.8	23.2
Year	87.7	—	—	—	—	398.0	—	400.0	86.5

e = estimated moving average drawn freehand.

In the above series, the ratios to moving average are fairly stable. Thus, the ratios could be accepted with confidence. Nevertheless, two additional steps were taken. Firstly, as column (4) of the table shows, the moving average was extended backwards for two quarters, yielding an additional observation for each of the first and second quarters. Secondly, related data on jewellery sales were developed back to 1941. The seasonal ratios for this previous period confirmed the seasonal pattern for the period 1947-1952.

In the example shown, a constant seasonal was used, and this is typical of the majority of the series. In addition, however, other types of seasonal indexes were developed to meet particular problems. They are summarized below:

1. Moving Seasonals. In some cases the seasonal variation shifted gradually through time. Personal expenditure on fuels was an example of this. The increased use of oil heating has latterly led to higher purchases of fuel in the fourth and first quarters of the year, in contrast with the lessening importance of consumer stock-piling of coal which often occurred in the summer months. When more data are available, it is hoped that a moving average of seasonal deviations may be computed in cases such as these; at present, the changes can be approximately accounted for by fitting a straight line.

2. Changing Patterns. In other cases, it was found that a sudden change in seasonal pattern was undergone, and neither a constant seasonal nor a moving seasonal would yield proper results. It was necessary, in such cases, to break the series and use two distinct seasonal patterns, one for each period. Interest and dividend payments abroad provide an example of such a case; a changed regulation at the end of 1950 relating to permission to make payments abroad abruptly altered the seasonal pattern. Two separate sets of seasonal ratios therefore had to be computed to cover the two periods.

3. Abnormal Circumstances Dissipating All Seasonality. There were some series for which seasonal ratios were applicable at some periods of time, but not at others. For example, in both 1947 and 1948, the purchase of new automobiles was not contingent upon any seasonal factor; rather excess demand in both periods resulted in rapidly rising consumer purchases. The application of fixed seasonal ratios to these figures would have distorted the actual situation. In such circumstances, where it was felt that no seasonal elements prevailed, no adjustment was made to the raw series.

4. Seasonal Changes in Absolute or Negative Amounts. In most cases, the deviation from moving average was in ratio form, inasmuch as the same quarter over a period of years differed from the moving average in more or less constant ratios. How-

ever, where the deviations from the moving average for the same quarters were not similar in percentage terms but were similar arithmetically, or where the unadjusted data approached zero or were negative, then a slightly different approach had to be used. In such cases, the seasonal variations were subtracted from the original data. All of the inventory series were seasonally adjusted by this technique.

Tests of Reliability

Once a series was adjusted for seasonal variation, there were two tests of reliability. First, the sum of the adjusted series should be approximately equal to the sum of the original data. Second, by inspection it should be possible to see that no seasonal was left in the series. If both these conditions were met, then the seasonal adjustment was judged to be good.

Special Problem of Seasonally Adjusting Accrued Net Income of Farm Operators

In the case of crop production the ordinary methods of adjusting the series for seasonal movements are inadequate. Crop production is characterized by concentration of output in the third quarter of the year and by large and erratic fluctuations about any average which may be constructed. Accordingly, the ordinary procedures for deseasonalization give rise to results which may create misleading impressions as to the movement of the Gross National Product. Pending the development of more satisfactory procedures, therefore, a simple expedient was employed of dividing the annual value of crop production into four equal parts in the seasonally adjusted tables. In going into a new year before the crop is known, production is estimated on the basis of average yields of preceding years, estimated acreage and initial prices. This preliminary first quarter estimate is revised later in the year as actual data become available.

It may be noted that the above technique is used in the case of crop production only, since it is only here that the special difficulties noted above arise. Livestock and other items are estimated on a quarterly basis and deseasonalized by standard techniques. Equalization and adjustment payments and undistributed profits of the Wheat Board are not seasonally adjusted, since they exhibit no consistent seasonal pattern, either in part or in total.

In order to depict more clearly movements in the value of production in the non-farm sector of the economy, an additional line in italics has been inserted in Tables 1 and 5 which shows "Gross National Product at Market Prices, excluding accrued net income of farm operators from farm production".

SECTION 3

MISCELLANEOUS NOTES

(a) Notes on Quarterly Survey of Corporation Profits

In 1949, when the feasibility of publishing the major components of the National Accounts on a quarterly basis was being discussed, it became clear that one of the most serious gaps in the statistics was in the area of quarterly corporation profits. Corporation profits are a large and volatile item, and there appeared to be no satisfactory quarterly indicators which could be used to interpolate between or to project from annual benchmark figures. A committee, composed of representatives of the Bank of Canada, the Department of National Revenue (Taxation Division), the Department of Finance, the Department of Trade and Commerce, and the Dominion Bureau of Statistics was formed to look into this problem. The view of the committee was that satisfactory quarterly corporation profits figures could be determined only through questionnaires sent to corporations, and the committee therefore concentrated on determining what questions should be asked and how to ensure the best response to the questionnaire.

The number of items requested was kept to a minimum. In general, the data requested was confined to profits, depreciation, and dividends paid and received, these being the major corporation financial items entering into the National Accounts. Other financial items are either small, stable, or can be projected on indicators already available. Sales were also requested since these were needed in the sample design.

Since there are more than 40,000 active taxable corporations in Canada, it was decided to take a sample of these corporations, rather than to attempt a complete count. Within each industrial group, companies were stratified into seven groups according to size of sales. (It is hoped that within the next year data will be available to stratify corporations according to size of assets, since at given points of time the size distribution of profits appears to match more closely the size distribution of assets than of sales). Companies were selected from each size group in proportion to the product of the number of corporations in the size group and the standard deviation of sales within the group, except for the group containing companies with sales of over \$5,000,000. This latter group contains about 600 corporations which account for more than 60 per cent of the profits of all corporations. All companies in this group were included in the sample design.

The sample data are used essentially to interpolate and project annual totals of profits tabulated by the Department of National Revenue and published

in the annual publication "Taxation Statistics". This volume usually appears about twenty-one months after the end of the calendar year to which it refers. For example, data for 1951 were available in August 1953.

The data, as obtained from income tax returns, differs from the sample data in several ways:

1. The information reported to the Department of National Revenue on income tax returns is usually in unconsolidated form. Thus, in 1950, only 62 corporations filed consolidated returns, and a change in the Income Tax Act prevents the filing of consolidated returns in 1952 and future years. On the other hand, a somewhat larger number of companies reporting in the quarterly profits sample file consolidated returns. The groups most affected are finance and wholesale trade. To date, the distribution of the data as per the quarterly sample has been applied to the Department of National Revenue benchmark figures without adjustment for the difference in content with respect to consolidation. This may have caused some error in trend, and the decision is open to review.

2. Department of National Revenue data are reported on a taxation year basis, while the sample data are on a calendar year basis. Thus, Department of National Revenue benchmark figures have had to be adjusted to a calendar year basis.

3. Some small adjustments have had to be made to change Department of National Revenue data from the industrial code used in their publications to the Standard Industrial Classification.

Since profits, as reported in the sample survey are not defined in the same way as profits in the National Accounts, some adjustments were made to the figures as reported. Canadian dividends received were subtracted, depletion was added back, and adjustments were made for changes in inventory or other reserves which are not current revenues or charges.

At the present time the sample data are subject to considerable sampling error. The response rate for companies sent questionnaires varies from about 65 per cent for firms with sales of over \$5,000,000 to about 15 per cent for those with sales of between \$50,000 and \$100,000, with an overall rate of about 30 per cent. Although extra questionnaires have been mailed, there is still considerable need for enlarging the number of reporting companies in order to increase the accuracy of the data. There is also some reason to believe that the sample may be biased up-

wards due to the possibility that reporting companies may not be representative, but are in general, better-than-average corporations.

A separate quarterly publication is being planned which will make available more detail of quarterly corporation financial statistics than is given in the present report.

(b) Notes on Constant (1949) Dollar Estimates of Gross National Expenditure

The general method of deflating current dollar estimates was described in "National Accounts, Income and Expenditure 1926-1950", pages 124 to 127. The quarterly deflation is carried out in a manner similar to that described in the above document. However, there are certain additional points to be emphasized.

The constant dollar estimates provided in Table 9 of the present publication are base-weighted, that is to say, prices of the year 1949 have been used to weight the various volume figures shown. On the other hand, the weighting of the implicit price indexes (which may be obtained at any stage of summation by dividing current dollars by constant dollars) is that of the Paasche's or currently weighted type. This type of price index cannot be used for quarter to quarter comparisons, because the weights change every quarter. To illustrate, prices of the base period and the second quarter are weighted by the second quarter basket of goods; prices of the base period and the third quarter are weighted by the third quarter basket of goods. Since these baskets differ (reflecting seasonal changes in the composition of production) price comparisons may not be made between the second and third quarters although each quarter may be compared with the base period.

The variations in the implicit price index of Gross National Expenditure due to the change in weights between the second and third quarters of recent years are in the order of magnitude of 10 per cent. Because of this large variation and the consequent possibility of misinterpretation, it was felt advisable

to omit the price indexes in the present document. It may be added that although the weighting effect is serious on a quarterly basis, the same does not apply to the annual figures, for which there is very little difference between fixed weight and changing weight price indexes, in most cases.

Although, as noted above, the overall price index for Gross National Expenditure is very difficult to interpret, the quarterly weight changes within certain groups are not large and a useful price comparison may be obtained for practical purposes by dividing current dollars by constant dollars for these groups. This is the case for personal expenditure on consumer goods and services, government expenditure on goods and services, new residential and non-residential construction and machinery and equipment. For these groups the current and base weighted price comparisons are almost identical on a quarterly basis and therefore price comparisons may be made among quarters as well as between each quarter and the base period. On the other hand, in the case of exports and imports of goods and services, the price indexes are quite different depending upon whether current or base weights are used, and therefore comparisons may be made only between a particular quarter and the base period. The price index pertaining to constant dollar inventory changes, with positive and negative weights, is not a price index in the usual sense, but is merely a result of the process of obtaining the value of physical change of inventories.

During the past two years the development of quarterly deflators has enabled the D.B.S. to employ quarterly weighting in the deflators for the annual figures. As a matter of fact, the constant 1949 dollar estimates of Gross National Expenditure and the deflators accompanying them, as shown in Tables 3 and 4 of "National Accounts, Income and Expenditure 1949-1952", incorporated the work with quarterly deflators and contained the effects of quarterly weighting. This type of quarterly weighting is obtained by deflating current values on a quarterly basis and summing current and constant dollars over four quarters of each year. The total current dollar estimate divided by the total constant dollar estimate for any item yields a quarterly weighted annual deflator.

